10. STF-02 GUN RANGE

Remedial action is required for the STF-02 Gun Range to address the potential human health and ecological risk posed by the lead contaminated soil. The site characteristics including the nature and extent of contamination, the summary of site risks, remedial action alternatives and the selected remedy are presented below.

The STF area has been used since 1983 for security force practice maneuvers including small arms target practice in a berm approximately 76 m (250 ft) northeast of the former STF-601 (see Figure 19). The berm was used from approximately 1983 to 1990. Approximately five million rounds were fired into the berm, including tracer rounds. None of the lead bullets that were fired into or that ricocheted away from the berm into the "kickout" areas have been picked up. Kickout is a term used to describe the ricocheted effects of lead bullets. Approximately 61 tons of lead and 3.4 tons of copper may be present at the site (Elliot 2000). No radionuclide contamination is anticipated. Figure 20 presents both an aerial photograph of the STF-02 Gun Range and a photograph of the range from the berm behind the Shooting House. More detailed information about the STF-02 Gun Range can be found in the OU 10-04 Comprehensive RI/FS report (DOE-ID 2001).

10.1 Site Investigations

Sampling of the Gun Range berm and surrounding soils was originally planned as part of the OU 10-04 remedial investigation sampling as described in a 1998 field sampling plan (FSP); however, those field activities were never conducted. Sampling at the Gun Range was instead conducted in 2000 according to the Field Sampling Plan (Elliott 2000).

10.2 Nature and Extent of Contamination

The lead contamination associated with the STF-02 Gun Range is from the bullets fired during small arms target practice. The lead contamination is present as large fragments as well as finely disseminated fragments in the soils. The lead contamination is widely distributed across this site with elevated concentrations detected up to 24,400 mg/kg in one of the berms. Two large areas of concern were identified for assessment following the field sampling. The Kickout area and the Remainder area. The Remainder area includes the berms, the area between the berms, the area around EOCR leach pond, the sand area, and the shooting house. The Kickout area was eliminated as a concern for both the HHRA and ERA during the risk assessment. Soil samples were collected at two depth intervals, 0 to 0.15 m (0 to 0.5 ft) and 0.15 to 0.45 m (0.5 to 1.5 ft). There were 85 soil samples and 6 field duplicates. The maximum concentration of lead detected (24,400 mg/kg) occurred in the 0.15 to 0.45 m (0.5 to 1.5 ft) depth range in the Remainder area. This data is presented in Appendix C of the OU 10-04 Comprehensive RI/FS (DOE-ID 2001).

10.3 Summary of Site Risks

The STF-02 Gun Range was retained for risk assessment in the OU 10-04 Comprehensive RI/FS (DOE-ID 2001) to evaluate the human health and ecological risk from lead detected in the remainder area at the facility. Appendix C of the OU 10-04 Comprehensive RI/FS (DOE-ID 2001) contains both summary statistics and exposure point concentrations.

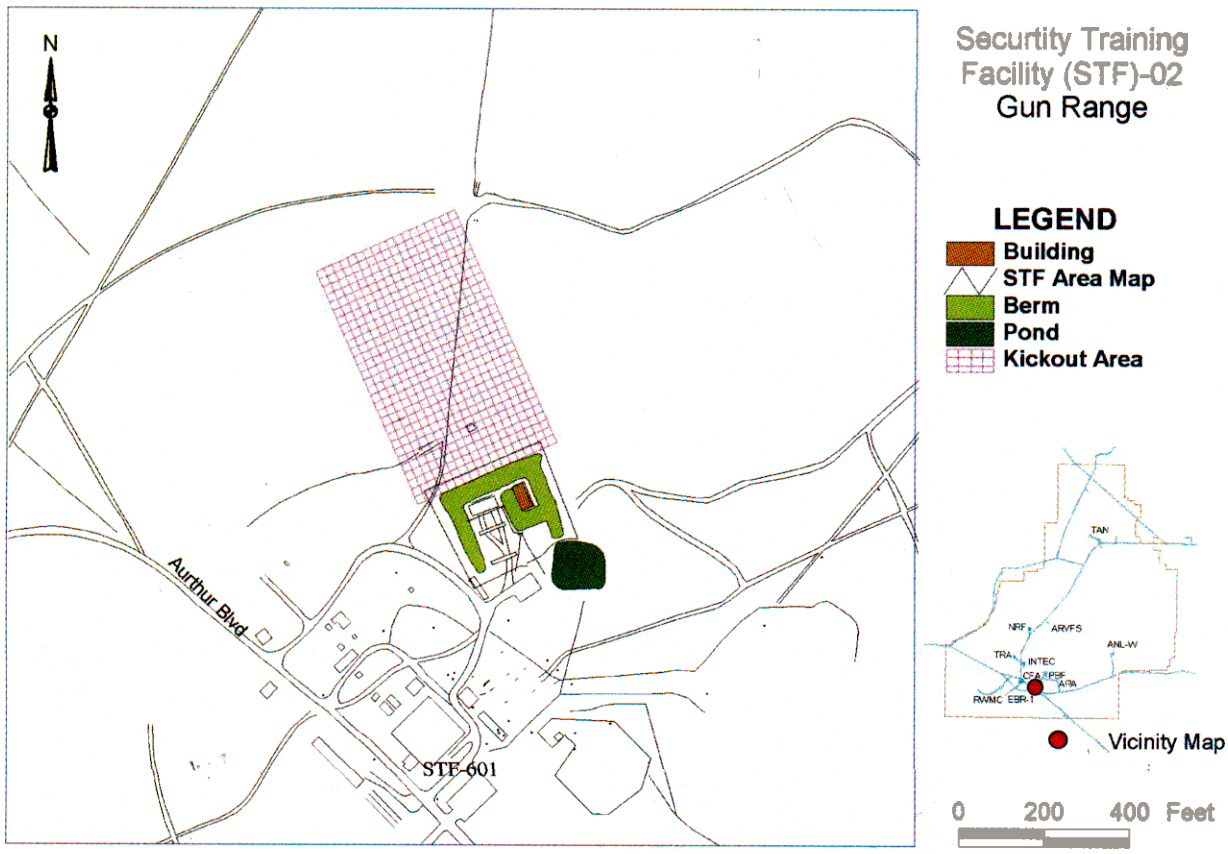

Figure 19. STF-02 Gun Range Site.

Figure 20. The STF-02 Gun Range. The top photograph is an aerial view of the STF Gun Range and the shooting house. The bottom photograph is a back view of the shooting house, gun range, berms, pads, and railroad ties.

The samples taken at the remainder area, in 2000 yielded concentrations of lead in excess of contaminant screening levels for human health, and concentrations of antimony, copper, lead, selenium, and zinc above screening levels for the ecological risk assessment. The results of the human health and ecological risk assessments are given below.

10.3.1 Human Health

The total estimated carcinogenic risk for potential future residents, current occupational workers, and future occupational workers at the STF-02 gun range was not determined because cancer slope factors are not available for lead. The Integrated Exposure Uptake Biokinetic (IEUBK) model, or the methodology presented by the EPA Technical Workgroup for Lead (EPA 1996), could have been used to evaluate the potential of adverse health effects from lead. However, it was not felt that a quantitative HHRA was necessary at this site since the maximum concentration of lead is more than sixty times greater than the screening level of 400 mg/kg given in EPA guidance (EPA 1994b). Due to these concentrations of lead in the soil presented in Table 27, it was determined that an unacceptably high potential exists for adverse health effects under the residential scenario.

Table 27. Soil concentrations for the lead at the STF-02 Gun Range.

Contaminant of Concern	Minimum Concentration (mg/kg)	Maximum Concentration (mg/kg)	Frequency of Detection	Background Concentration (mg/kg)[a]	Exposure Point Concentration (mg/kg)	Statistical Measure[b]
Lead	2.9	24,400	64/72	17	24,400	Maximum

a. The background value for composite samples is from Rood, Harris, and White (1996).

b. The lower of either the maximum or the 95% UCL (95% upper confidence limit on the mean soil concentration) was used in the assessment.

10.3.2 Ecological

Lead was identified as a COC for the STF-02 Gun Range, based on HQs for ecological receptors. The ecological assessment indicated that the HQs for exposure to lead in the surface and subsurface soil range from 2 for the ferruginous hawk to a maximum of 2,000 for the sage sparrow. The black-billed magpie, burrowing owl, deer mouse, loggerhead shrike, mourning dove, Townsend's western big-eared bat, pygmy rabbits, and plants also have HQs exceeding 1.0. The pygmy rabbit is classified as a species of special concern by the State of Idaho.

10.4 Remediation Objectives for the STF-02 Gun Range

Remediation objectives based on the unacceptable risks discussed previously (Section 10.3) were developed for the STF-02 Gun Range. Unacceptable ecological risk is associated with the lead concentration in the soil at the STF-02 Gun Range. Lead concentrations exceed the 400 mg/kg EPA screening level (EPA 1994) and, if allowed to migrate, could result in groundwater contamination exceeding the MCL for lead.

Remedial Action Objectives for the Gun Range were developed in accordance with the *National Oil and Hazardous Substances Contingency Plan* (NCP) (40 CFR 300) and EPA guidance (EPA 1988) and through the consensus of DOE-ID, EPA, and IDEQ participants. The RAOs are based on the results of both human health requirements and ERAs and are specific to lead as the only COC.

The RAOs specified for protecting human health are expressed both in terms of risk and exposure pathways, because protection can be achieved through reducing contaminant levels as well as through restricting or eliminating exposure pathways. The RAOs specified for protecting ecological receptors inhibit adverse effects from contaminated soil on resident populations of flora and fauna.

The RAOs developed for the STF-02 Gun Range to protect human health and ecological receptors are as follows:

- Prevent exposure to soils contaminated with lead at concentrations greater than 400 mg/kg.
- Prevent groundwater contamination.
- Inhibit ecological receptor exposures to soil contaminated with COCs, primarily concentrations in soils that result in an HQ greater than or equal to 10.0. The RAO excludes naturally occurring elements and compounds that are not attributable to historic releases.

To meet these objectives, remediation goals were established. The remediation goal and basis for the goal are provided in Table 28. The remediation goal can be satisfied by cleaning up to the identified contaminant concentration in the soil to below 400 mg/kg. Removal of the contaminated media from the STF-02 site will further reduce any potential groundwater risk. The area and volumes of contaminated media at STF-02 is presented in Table 29.

Table 28. Remediation goal for the OU 10-04 STF-02 Gun Range.

		Human Health		Ecological		Range of Detected COC Concentrations at Site (mg/kg)	
Site	Exposure Pathway	COC	Final Remediation Goal (mg/kg)	COC	Final Remediation Goal (mg/kg)	Minimum Concentration	Maximum Concentration
STF-02	Direct exposure and Groundwater	Lead	400[a]	Lead	400[b]	3.05	24400

a. Region 9, EPA remediation goal for soil under the residential scenario.

b. Development of remediation goal for ecological receptors presented in Appendix K (DOE-ID 2001).

Table 29. Areas and volumes of contaminated media for the OU 10-04 STF-02 Gun Range.

Site Name	Area of Site m^2 (yd^2)	Contaminated Soil Volume m^3 (yd^3)	Waste and Debris Volume m^3 (yd^3)
STF-02 Gun Range			
Gun Range soil site	9,570 (11,450)	14,900 (19,450)	NA
Leach Pond	1,300 (1,600)	405 (530)	NA
70 creosote-treated railroad ties (6 in. ×8 in. ×10 ft)	NA	NA	6.7 (8.7)
Asphalt pads	90 (107)	NA	2.1 (2.7)
STF-612 wooden building	NA	NA	3.8 (5)
Lead debris (fragments, unfired rounds)	NA	NA	4.8 (6.3)
Copper debris (fragments, unfired rounds)	NA	NA	0.2 (0.3)

10.5 Description of Alternatives for the STF-02 Gun Range

Three major remedial alternatives were developed to address the lead contaminated soils at the STF-02 Gun Range: Alternative 1, no action; Alternative 2, limited action; Alternative 3, removal, ex situ treatment and disposal or return of treated soils to the excavation sites. The third alternative has two variations, Alternative 3a and 3b. Alternative 1 (no action) and 2 (limited action) were not considered for selection because they would not meet the threshold criteria for protection of human health and the environment and compliance with laws. However, the no action alternative was evaluated in detail to provide a baseline for comparison of the alternatives as required under CERCLA.

10.5.1 Alternative 1: No Action

Formulation of a no action alternative is required by the *National Oil and Hazardous Substances Pollution Contingency Plan* (NCP) (40 CFR 300.430[e][6]) and guidance for conducting feasibility studies under CERCLA (EPA 1988). The no action alternative serves as the baseline for evaluating other remedial action alternatives. The alternative includes environmental monitoring, but does not include any actions to reduce potential exposure pathways, such as fencing, deed restrictions, or administrative controls (EPA 1988).

10.5.2 Alternative 3: Removal, Ex Situ Treatment, and Disposal or Return to Excavations

Implementation of this alternative involves excavation of the berms and surroundings soils with concentrations greater than the final remediation goal, physical separation to remove metal fragments and bullets, recycling of the metal fragments as allowed by DOE policy or stabilization and disposal, treatment of the soils with subsequent disposal on or off the INEEL or return to the excavation sites. Conventional excavation and soil screening equipment would be used. Verification sampling would be conducted to ensure that all contamination at concentrations exceeding final remediation goals was removed. Excavations exceeding 1 ft in depth would be backfilled with clean soil following the excavation. Shallow excavations would be recontoured to blend with the existing landscape.

In addition, the railroad ties used to support the targets would be removed, and disposed of in an appropriate landfill, such as the Waste Management Northwest landfill in Arlington, Oregon, or the ICDF. Treatment of the railroad ties by encapsulation is required, as they are RCRA characteristic for lead. The small wooden building (the shooting house) and asphalt pads would be removed and disposed of as debris at a facility on the INEEL, such as the CFA landfill.

Under Alternative 3, the metal fragments and bullets would be physically separated from the soils and sent for recycling if allowed by DOE policy. If DOE does not allow recycling of the lead fragments, they will be stabilized and disposed in an approved landfill. As much particulate metal will be removed physically from the soil as possible. After physical separation, soils would be sampled, and if determined to exceed the RCRA lead toxicity characteristic limit, they would be treated to meet RCRA disposal criteria and disposed in an approved landfill. If the soil concentrations exceed the final remediation goal, but are not RCRA toxic for lead, the soil would be disposed without further treatment at the CFA Landfill, the proposed ICDF, or other approved landfill on or off the INEEL. If the soils do not exceed the final remediation goal and the RCRA toxicity limit for lead, they would be returned to the excavation sites without further treatment.

10.5.2.1 Alternative 3a: Removal, On-Site Stabilization, and Disposal. Implementing this alternative involves removal of the berms and excavation of all surrounding soils with concentrations above the final remediation goal, physical separation to segregate the metal fragments and bullets (which

will be sent for recycling if allowed by DOE policy), and treatment of soil by stabilization if sampling indicates the soil is RCRA characteristic for lead. If DOE does not allow recycling of the metal fragments, they would be stabilized and disposed in an approved landfill. If the soil concentrations, after physical separation, exceed the final remediation goals, but are not RCRA toxic for lead, they would be disposed without further treatment at an approved facility on or off the INEEL. Soil not exceeding the final remediation goal and the RCRA lead toxicity limit would be returned to the excavation sites.

10.5.2.2 Alternative 3b: Removal, On-Site Soil Washing, and Return of Soil to the Excavations. Implementing this alternative would involve removal of the berms and excavation of all surrounding soils with concentrations above the final remediation goal, and physical separation to remove metal fragments and bullets; which will be sent for recycling if allowed by DOE policy. If DOE does not allow recycling of the metal fragments, they would be stabilized and disposed in an approved landfill. As much particulate metal will be removed physically from the soil as possible. After physical separation, soils would be sampled, and if determined to exceed the RCRA lead toxicity characteristic limit, they would be washed with an acid. If the final remediation goal for lead is achieved after soil washing, the soil would be returned to the excavated sites. If after washing the soil exceeds final remediation goals, but is not RCRA toxic for lead it would be disposed of without further treatment at a landfill such as CFA or ICDF. The soil washing secondary waste would be treated and disposed on the INEEL at an approved facility. If the soil concentrations exceed the final remediation goal, but are not RCRA toxic for lead, the soil would be disposed without further treatment at an approved industrial landfill on or off the INEEL. If the soils do not exceed the final remediation goal and the RCRA toxicity limit for lead, they would be returned to the excavation sites without treatment.

10.5.3 Comparison of Elements and Distinguishing Features of Each Alternative

The relative performance of each alternative is described in Table 30.

10.6 Comparative Analysis of Alternatives for the STF-02 Gun Range

The alternatives were evaluated using the nine evaluation criteria as specified by CERCLA (40 CFR 300.43[f][5][i]). The purpose of this comparison is to identify the relative advantages and disadvantages associated with each alternative. The comparative analyses of alternatives for the nine criteria are summarized below.

10.6.1 Overall Protection of Human Health and the Environment

Under the no action alternative, human health and environmental risks would not be mitigated. The absence of controls for the STF-02 Gun Range lead, debris, and contaminated soils results in no reduction of risks and the RAOs would not be met. Alternatives 3a and 3b would provide highly effective, long-term protection of human health and the environment. Removal of the metal fragments would eliminate potential risks from contaminant migration. Removal and treatment of contaminated soils would also eliminate risk from exposure and migration. Therefore, Alternatives 3a and 3b meet specified RAOs and provide for overall protection of human health and the environment.

10.6.2 Compliance with ARARs

Comparison of compliance with ARARs is summarized in Table 30 for the STF-02 Gun Range. The ARARs for Alternative 1 (no action) would not be met for the STF-02 Gun Range. Alternatives 3a and 3b would both meet all ARARs for STF-02 Gun Range

Table 30. Detailed analysis summary for the OU 10-04 STF-02 Gun Range.

Criteria	Alternative 1 No Action	Alternative 3a Removal, Ex Situ Stabilization, and Disposal	Alternative 3b Removal, Soil Washing, and Disposition on the INEEL
Overall protection of human health and the environment			
Human health protection	No reduction in risk	Eliminates potential exposure to waste by removing contamination from the site	Eliminates potential exposure by removing contamination from the site
Environmental protection	Allows continued ecological exposures	Eliminates potential ecological exposure to waste by removing contamination from the site	Eliminates potential ecological exposure to waste by removing contamination from the site
Compliance with ARARs			
Chemical-specific			
Idaho Groundwater Quality Standards – IDAPA 58.01.11.200	Would not meet ARAR	Would meet ARAR	Would meet ARAR
Action-Specific			
Rules and Standards for Hazardous Waste in Idaho– IDAPA 58.01.05.010.006, .008, and .011	Not applicable	Would meet ARAR	Would meet ARAR
Requirements for Recyclable Materials – 40 Code of Federal Regulation 261.6	Not applicable	Would meet ARAR	Would meet ARAR
Hazardous Waste Determination – 40 Code of Federal Regulation 262.11	Not applicable	Would meet ARAR	Would meet ARAR
Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities – 40 Code of Federal Regulation 264	Not applicable	Would meet ARAR	Would meet ARAR
Idaho Fugitive Dust Emissions—IDAPA 58.01.01.650 through .651	Not applicable	Would meet ARAR through use of engineering controls	Would meet ARAR through use of engineering controls
Rules for Control of Air Pollution in Idaho—IDAPA 58.01.01.161, IDAPA 58.01.01.500.2, and IDAPA 58.01.01.585 through .586:	Not applicable	Would meet ARAR through use of engineering controls	Would meet ARAR through use of engineering controls
NESHAPS—40 Code of Federal Regulation 63.543 - .545	Not applicable	Would meet ARAR through use of engineering controls	Would meet ARAR through use of engineering controls

Table 30. (continued).

Criteria	Alternative 1 No Action	Alternative 3a Removal, Ex Situ Stabilization, and Disposal	Alternative 3b Removal, Soil Washing, and Disposition on the INEEL
Location-specific			
Native American Graves Protection and Repatriation Act—25 USC 32	Not applicable	Would meet ARAR through surveys and assessments and actions deemed necessary	Would meet ARAR through surveys and assessments and actions deemed necessary
National Historic Preservation Act—36 Code of Federal Regulation 800	Not applicable	Would meet ARAR through surveys and assessments and actions deemed necessary	Would meet ARAR through surveys and assessments and actions deemed necessary
Long-term effectiveness and permanence			
Magnitude of residual risk	No change from existing risk	No residual risk would remain at site	No residual risk would remain at site
Adequacy and reliability of controls	No control and, therefore, no reliability	Disposal facilities for treated waste, contaminated soils and debris are assumed to provide adequate and reliable control for the period of institutional control; stabilized waste form estimated to provide reliable control over contamination in waste for at least 1000 years	Soil washing is expected to remove at least 90% of lead contamination from the soil; the secondary waste can be effectively treated to provide reliable controls for at least 1000 years
Reduction of toxicity, mobility, or volume through treatment			
Treatment process used	Not applicable	Stabilization	Soil washing
Amount destroyed or treated	Not applicable	Approximately 100%	Approximately 90%
Reduction of toxicity, mobility, or volume	Not applicable	30 –50% volume reduction, 95% mobility reduction, and 0% toxicity reduction	20% volume increase, >90% mobility reduction, 0% toxicity reduction
Irreversible treatment	Not applicable	Not reversible, but affords long-term stability	Not reversible, but affords long-term stability
Type and quantity of residuals remaining after treatment	Not applicable	No waste would be left at the site; soil would be stabilized and railroad ties would be encapsulated	No waste would be left at the site. Soils would be returned to the site after treatment; the secondary waste from soil washing would be treated and disposed, most likely by stabilization; the railroad ties would be encapsulated
Statutory preference for treatment	Not applicable	Meets preference	Meets preference
Short-term effectiveness			
Community protection	No increase in potential risks to the public	No increase in potential risks to the public during transportation	No increase in potential risks to the public

Table 30. (continued).

Criteria	Alternative 1 No Action	Alternative 3a Removal, Ex Situ Stabilization, and Disposal	Alternative 3b Removal, Soil Washing, and Disposition on the INEEL
Worker protection	Not applicable	Workers protected by engineering and administrative controls	Workers would be exposed to acids and hazardous secondary waste, but would be protected by engineering and administrative controls
Environmental impacts	No change from existing conditions	Limited to disturbances from vehicle and material transport activities associated with excavation of the soils and debris	Limited to disturbances from vehicle and material transport activities associated with excavation of the soils and debris
Time until action is complete	Not applicable	Approximately 18 to 24 months	Approximately 18 to 24 months
Implementability			
Ability to construct and operate	No construction or operation	Easy, involves available excavation, transportation, and stabilization technology	Easy, involves available excavation, transportation and treatment technology
Ease of implementing additional action if necessary	May require repeat of feasibility study and record of decision process	Easy, would only involve removal and treatment of additional soil	Easy, would only involve removal and treatment of additional soil
Ability to monitor effectiveness	Monitoring of conditions is readily implemented	The effectiveness in stabilizing all contaminants is easily monitored	Sampling to verify treatment performance is easily performed
Ability to obtain approvals and coordinate with regulatory agencies	No approvals required	No difficulties identified	No difficulties identified
Availability of services and capacity	None required	Services available on-Site or through subcontractor	Services available on-Site or through subcontractor
Availability of equipment, specialists, and materials	None required	Equipment and materials are available either on-Site, through subcontractors, or will be purchased	Equipment and materials are available either on-Site, through subcontractors, or will be purchased
Availability of technology	None required	Available at the INEEL and commercially	Available at the INEEL and commercially
Cost (net present worth, 5% discount rate)			
Capital Cost	$0.6 million	$3.5 million	$8.1 million
Operations and Maintenance Cost	$2.7 million	NA	NA
Total Cost	$3.3 million	$3.5 million	$8.1 million

10.6.3 Long-Term Effectiveness and Permanence

Alternative 1 (no action) would provide the least long-term effectiveness and permanence for the STF-02 Gun Range. Alternative 3a (excavation, stabilization, and disposal) would provide a high degree of long-term effectiveness and permanence, because the waste would be removed from the site, treated, and disposed of in a secure landfill. Alternative 3b (excavation, soil washing, and disposition at the site) is equally protective. Some lead contamination (below risk-based levels) could be returned to the site since treatment may not be 100% effective in removing lead contamination from the soil and the amount of residual lead contamination returned to the site is likely to be the same for both Alternatives 3a and 3b.

10.6.4 Reduction of Toxicity, Mobility, or Volume through Treatment

There is no reduction of toxicity, mobility, or volume through treatment in Alternative 1 (no action). In alternatives 3a and 3b the soil is treated to remove lead, the principal threat waste. While the toxicity of the lead will not be reduced, the lead would be stabilized to reduce mobility. The waste volume would increase from stabilization and soil washing.

10.6.5 Short-Term Effectiveness

Alternative 1 (no action) would be the most effective in the short-term because no actions would be taken to cause worker exposure. No off-Site exposures would occur because none of the sites are located near inhabited areas and no public roads are in the vicinity. No additional environmental impacts would result from this alternative other than the conditions already existing. Contaminant migration from surface soils via wind and water infiltration is of concern.

Alternative 3a, removal, ex situ stabilization and disposal, is considered effective for short-term protection as the exposure risk to workers during excavation, screening, treatment, transport, and disposition of the soils and debris would be low. Alternative 3b, removal, soil washing, and disposal is considered less effective as the soil washing process involves use of concentrated acid, which poses safety concerns for workers conducting the treatment. The soil washing process also takes much longer to perform than stabilization and creates a significant volume of hazardous secondary waste, which also increases risk to on-Site workers.

10.6.6 Implementability

Each of the alternatives retained for detailed analysis is technically implementable. Alternative 1 (no action) would be the most implementable for the STF-02 Gun Range, because it requires no actions or changes to existing site conditions.

Alternative 3a for the STF-02 Gun Range is considered more implementable than Alternative 3b. The stabilization process for soil uses conventional and readily available equipment and technology known to be effective. The effectiveness of soil washing is not as well demonstrated. Treatability studies would be required to determine the effectiveness on the soils at the STF-02 Gun Range, and there is some uncertainty that the technology would not meet final remediation goals.

10.6.7 Cost

Alternative 1 (no action) has an estimated cost of $3.3 million from long-term monitoring, which would be required until 2095 based on the Comprehensive Facility and Land Use Plan. The estimated cost for Alternative 3a is $3.5 million and for Alternative 3b the cost is $8.1 million. Details of the cost estimates are provided in the OU 10-04 Comprehensive RI/FS (DOE-ID 2001, Appendix I).

10.6.8 State Acceptance

The IDEQ has been involved in the development and review of the OU 10-04 RI/FS report (DOE-ID 2001), the Proposed Plan (DOE-ID 2002), and this ROD. All comments received from IDEQ on these documents have been resolved and the documents revised accordingly. In addition, IDEQ has participated in public meetings where public comments and concerns have been received and responses offered. The IDEQ concurs with the selected remedial alternative for the STF-02 Gun Range contained in this ROD and is a signatory to the ROD with DOE and EPA.

10.6.9 Community Acceptance

Community participation in the remedy selection process and Proposed Plan reviews included participation in the public meetings held February 7 and 12, 2002 (see Section 3). The 30-day public comment period was extended an additional 30-days due to an extension request from the public. The public comment period began on January 28, 2002 and ended March 29, 2002. The Responsiveness Summary, presented as Part 3 of this ROD, includes verbal and written comments received from the public and the DOE responses to these comments. Representatives of the EPA and IDEQ assisted in the development of the responses.

All comments received on the Proposed Plan were considered during the development of this ROD. While some concerns were raised regarding the need to process all soil in the berms and kick-out areas, and control air emissions during remediation, in general the public was supportive of the preferred alternative for the STF-02 Gun Range and concurred with the conclusion that removal of the lead in the soil is required to satisfy the CERCLA threshold criteria for protection of human health and the environment and compliance with the regulations.

10.7 Selected Remedy for the STF-02 Gun Range

The selected remedy for the STF-02 Gun Range is Alternative 3a, removal, treatment, and disposal of soil on or off the INEEL. This remedy was selected based on the results of the comparative analysis of alternatives. Alternative 3a will be protective of human health and the environment and comply with laws. It has high long-term effectiveness because contaminants and other waste will be removed from the site. Reduction of toxicity, mobility, and volume will be moderate; lead fragments will be separated from the soil (and either recycled or treated and disposed), contaminated soil exceeding RCRA lead toxicity limits will be stabilized and disposed, and contaminated soil exceeding the final remediation goal, but below RCRA toxicity limits, will be removed and disposed in a secure landfill. As a result, contaminants will be contained, protecting humans and ecological receptors from exposure. Short-term effectiveness will be high, because there is no acute toxicity, and use of personal protective equipment and adherence to standard protocols for sampling and processing the soil will minimize exposure risks to workers. Implementability of Alternative 3a is high because equipment, technologies, and personnel are all available.

Remediation of the STF-02 Gun Range will include the following activities:

- Excavate the berms, surrounding soil and the adjacent pond with mechanical equipment to remove soil above the remediation goal for lead. Field screening will be used to initially identify the extent of soil excavation required to meet the remediation goal.
- Perform physical separation to remove copper and lead fragments (bullets, casings, etc.), which will be recycled off the INEEL if allowed by DOE policy. If DOE policy prohibits recycling of the recovered metal, it will be stabilized and disposed in a RCRA compliant facility on or off the INEEL.
- After sorting, return soil containing lead in concentrations below the remediation goal to the site. Stabilize soil that is RCRA characteristic for lead and send to an approved facility located off or on the INEEL for permanent disposal, such as the CFA landfill or the proposed INEEL CERCLA

Disposal Facility (ICDF). Dispose of soil above the remediation goal, but not RCRA characteristic for lead without further treatment at the CFA landfill, the ICDF, or other approved location on or off the INEEL.

- Encapsulate the railroad ties and send to a RCRA compliant landfill on or off the INEEL.
- Dispose of the wooden building and asphalt pads as nonhazardous construction debris on the INEEL in an appropriate landfill, such as the Central Facilities Area (CFA) landfill or the ICDF.
- Contour the excavated areas to match the surrounding terrain, and vegetate.
- Sample and analyze soil to verify the remediation goal is achieved. Because all contamination above the remediation goal will be removed, monitoring and sampling after remediation will not be required and the need for institutional control is not anticipated.

10.7.1 Cost

The estimated cost for Alternative 3a, removal, treatment, and disposal, is $3.5 million (see Table 31).

10.7.2 Estimated Outcomes of the Selected Remedy

Remediation of the STF-02 site by soil removal, sorting, and treatment to meet the remediation goal will reduce risk to ecological receptors, future workers, and residents. To help simplify the soil removal process, debris such as the small wooden building, railroad ties and asphalt pads will be removed and disposed. While current land-use projections indicate that this area is designated for continued industrial use, the remediation goal also ensures adequate protection of future residents if this area becomes available for residential use.

10.8 Statutory Determinations for the STF-02 Gun Range

10.8.1 Overall Protection of Human Health and the Environment

Alternative 3a provides highly effective, long-term protection of human health and the environment. Removal of the metal fragments will eliminate potential long-term risks from contaminant migration. Removal and treatment of contaminated soils eliminates risk from exposure and migration. Therefore, Alternative 3a will meet specified RAOs and provide for overall protection of human health and the environment.

10.8.2 Compliance with ARARs and TBCs

Table 32 presents the evaluation of Alternative 3a for compliance with ARARs and TBCs. The removal of lead contamination will prevent contamination of groundwater; hence, the groundwater standards will be met.

The lead fragments recovered from the initial soil screening will be sent off-Site for recycling, if allowed by DOE policy, or stabilized to meet RCRA disposal criteria and disposed in a RCRA-compliant facility. Stabilization of lead contaminated soil will be in compliance with RCRA requirements for hazardous waste disposal. These actions will satisfy Idaho hazardous waste and RCRA ARARs.

Using air monitoring, dust suppression techniques, and air emission controls during excavation and treatment would ensure compliance with emissions ARARs. The site will be surveyed for cultural resources, and Native Americans will be consulted to identify appropriate actions needed to satisfy ARARs protection of sensitive resources. Alternative 3a is therefore, capable of satisfying all ARARs and TBCs.

Table 31. Cost estimate summary for OU 10-04 STF Gun Range selected remedy.

Description	Cost (Net Present Value)	Totals
Capital Costs		**2,676,000**
Remedial Design	**514,000**	
Remedial design/remedial statement of work	76,000	
Remedial design work plan	10,000	
Environmental, safety and health plan	94,000	
Sampling and analysis plan	102,000	
Quality assurance project plan	23,000	
Site operation and maintenance plan	34,000	
Draft final design/report preparation	23,000	
Remedial action work plan	59,000	
Plans and specifications	70,000	
Deed restriction reviews	0	
Miscellaneous environmental documents	23,000	
Remediation Support	**146,000**	
Quality assurance	22,000	
Project office operations	124,000	
Remediation/Technical Support Activities	**42,000**	
Engineering and technical support	42,000	
Remedial Action	**1,929,000**	
Mobilization & prep. work	12,000	
Site work	1,880,000	
Site restoration	8,000	
Demobilization	12,000	
Other	17,000	
Removal Action	**44,000**	
Summary report	44,000	
Operations Cost	**NA**	
Cleanup Tech. Admin. Activities Program Management	**0**	
Project and baseline management/report	0	
Post ROD Ops and Maintenance	**0**	
Caretaker maintenance	0	
Monitoring	**0**	
Field sampling plan	0	
Sampling	0	
5-year reviews	0	
General and Administrative (G&A)		**44,000**
SUBTOTAL COSTS		**2,719,000**
Plus 30% Contingency		**816,000**
TOTAL PROJECT COST IN NET PRESENT VALUE		**3,535,000**

NOTE: Net present value is the cumulative worth of all costs, as of the beginning of the first year of activities, accounting for inflation of future costs. Net present values are estimated assuming variable annual inflation factors for the first 10 years, in accordance with DOE Order 430.1, followed by a constant 5% annual inflation rate. A constant 5% discount rate is assumed.

Table 32. ARARs and TBCs for selected alternative—removal, ex situ treatment, and disposition—for OU 10-04 STF-02 Gun Range.

Category	Citation	Reason	Relevancy[a]
Chemical-specific applicable, relevant, and appropriate requirements (ARARs)			
Idaho Ground Water Quality Rule	IDAPA 58.01.11.200	Lead leaching from the site must not adversely affect groundwater quality; standards for groundwater quality must be met.	A
Action-specific ARARs			
Rules for the Control of Air Pollution in Idaho	Fugitive Dust IDAPA 58.01.01.650 and .651	Requires control of dust at all times, especially during excavation and processing of the soil.	A
	Toxic Substances IDAPA 58.01.01.161 Toxic Air Emissions IDAPA 58.01.01.585 and .586	The release of carcinogenic and non-carcinogenic contaminants into the air must be estimated before the start of construction, controlled if necessary, and monitored during excavation and processing of soil	A
	Requirements for Portable Equipment IDAPA 58.01.01.500.2	Portable equipment for soil excavation and processing must be operated to meet state and federal air emission rules.	A
National Emission Standards for Hazardous Air Pollutants (NESHAP)	National Emission Standards for Hazardous Air Pollutants from Secondary Lead Smelting 40 CFR 63.543(a)	Lead emissions from soil excavation and processing can not exceed 2.0 mg per dry standard cubic meter.	RA
Resource Conservation and Recovery Act – Standards Applicable to Generators of Hazardous Waste	Requirements for Recyclable Materials IDAPA 58.01.05.005 (40 CFR 261.6[a]([b])	Recovered scrap metal sent for recycling will be considered recyclable materials and will not be subject to RCRA requirements for generators, transporters, or storage.	A
	Hazardous Waste Determination IDAPA 58.01.05.006 (40 CFR 262.11)	A RCRA hazardous waste determination is required for the soil, debris, recovered metal, and other secondary waste generated during remediation, which is to be treated or disposed of on or off the INEEL.	A

Table 32. (continued).

Category	Citation	Reason	Relevancy[a]
Resource Conservation and Recovery Act – Standards Applicable to Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Units	General Facility Standards for Owners and Operators of Remediation Waste Management Sites IDAPA 58.01.05.008 (40 CFR 264.1[j][1-13])	General RCRA performance standards must be met during remediation.	A
	Equipment Decontamination IDAPA 58.01.05.008 (40 CFR 264.114)	All equipment used during remediation that contact hazardous waste must be decontaminated in accordance with RCRA requirements.	A
	Use and Management of Containers IDAPA 58.01.05.008 (40 CFR 264.171-177)	Hazardous waste generated during remediation that is managed in containers must meet RCRA requirements.	A
	Staging Piles IDAPA 58.01.05.008 (40 CFR 264.554)	Any hazardous waste managed as a staging pile during remediation must meet RCRA requirements, and at the end of remediation the staging pile must be closed in accordance with RCRA requirements.	A
Resource Recovery and Conservation Act – Land Disposal Restrictions	Treatment Standards IDAPA 58.01.01.11 (40 CFR 268.40[a][b][e])	Any recovered metal and debris that can not be recycled that is a RCRA hazardous waste must be treated if necessary to meet RCRA land disposal restriction criteria before disposal.	A
	Treatment Standards for Hazardous Debris IDAPA 58.01.05.011 (40 CFR 268.45 [a-d])		
	Universal Treatment Standards IDAPA 58.01.05/011 (40 CFR 268.48[a])		
	Alternative Treatment Standards for Contaminated Soil IDAPA 58.01.05.011 (40 CFR 268.49)	Applies to any contaminated soil that is to be removed from the STF-02 Gun Range Site and disposed of in an approved facility on or off the INEEL.	A

Table 32. (continued).

Category	Citation	Reason	Relevancy[a]
Clean Water Act of 1977 (33 U.S.C. 121 *et seq.*)	National Pollutant Discharge Elimination System (NPDES) (40 CFR 122.26)	A project-specific storm water pollution prevention plan is required for construction activities at the STF-02 Gun Range Site.	A
Location-specific ARARs			
National Historic Preservation Act	Historic properties owned or controlled by Federal agencies 16 USC 470 h-2 Identifying Historic Properties 36 CFR 800.4 Assessing Effects 36 CFR 800.5	In accordance with federal requirements, the site must be surveyed for cultural and archeological resources before construction and appropriate actions must be taken to protect any sensitive resources.	A
Native American Graves Protection and Repatriation Act	Custody 25 USC 3002 (43 CFR 10.6) Repatriation 25 USC 3005 (43 CFR 10.10)	In accordance with federal requirements, the site must be surveyed for cultural and archeological resources before construction and appropriate actions must be taken to protect any sensitive resources.	A

a. A = Applicable; RA = Relevant and Appropriate

10.8.3 Cost-Effectiveness

The selected remedy is cost-effective because it is the least costly alternative that satisfies threshold criteria. When compared to other potential remedial actions, the selected remedy provides the best balance between cost and effectiveness in protecting human health and the environment.

10.8.4 Use of Permanent Solutions and Alternative Treatment Technologies

The selected remedy provides effective, long-term protection of human health and the environment. The removal of all contaminated soil above the final remediation goal from the STF-02 Gun Range will minimize potential long-term human health and environmental concerns associated with future exposure to, or contaminant migration from, uncontrolled release sites. The disposal facility will provide long-term isolation of the contaminated soil and debris. Since all contaminated soils, above the final remediation goal will be removed during the cleanup process, institutional controls after remediation are not necessary.

10.8.5 Preference for Treatment as a Principal Element

The selected remedy, Alternative 3a, removal, on-Site stabilization, and disposal, prescribes treatment of the lead contaminated soil and debris, a principal threat waste, by stabilization followed by disposal in an approved disposal facility. Therefore, the selected alternative satisfies the preference for treatment as a principal element of the selected remedy.

10.8.6 Five-Year Reviews

Five-year reviews will be conducted for all sites with institutional controls. Land use will be restricted at STF-02 until remediation is implemented as prescribed in this ROD. Land use controls will not be required after remediation is all contamination above remediation goals is removed. Otherwise, institutional controls will be maintained until discontinued based on results of a 5-year review.

11. LIMITED ACTION

Limited action comprising institutional controls will be implemented at seven sites within OU 10-04 because residual contamination precludes unrestricted use. In addition, all nine sites addressed by the remedial actions discussed in Sections 8, 9, and 10 will be controlled until remediation is implemented, then evaluated for post-remediation controls. The 16 sites that will be managed initially through institutional controls and the future development of the WAGs 6 and 10 O&M Plan that will contain the plans for institutional controls are discussed below.

No action with Site-wide long-term ecological monitoring at the INEEL will also be implemented. The need for long-term ecological monitoring was based on the results of the INEEL-wide ecological risk assessment to ensure protection of this important ecosystem.

11.1 Institutional Controls in Waste Area Groups 6 and 10

Institutional controls will be maintained by DOE at any CERCLA site at the INEEL where risk is greater than 1E-04 (i.e., 1 in 10,000) for a hypothetical current residential scenario. However, baseline risk assessments at the INEEL typically do not estimate risk for a current residential scenario (LMITCO 1995). For purposes of evaluating the need for institutional controls at WAGs 6 and 10, the potential for current residential risk in excess of 1E-04 was inferred from the risk assessment for the 100-year future residential scenario. Any site with 100-year future residential scenario with an estimated risk of 1E-06 (i.e., 1 in 1,000,000) or greater was assumed to pose a current residential risk of 1E-04. Institutional controls will remain in place at each of these seven limited action sites until at least 2095, based on the Comprehensive Facility and Land Use Plan, or until the site is released for unrestricted use in a 5-year review.

Of the seven limited action sites, one is an ordnance site. Risks estimates for the 100-year future residential scenario for residual soil contamination at the other six limited action sites are less than 1E-04, but current risks for these sites may be greater than 1E-06 for a residential scenario.

Institutional controls will be maintained in the interim until the selected remedy has been implemented at all nine sites identified for remediation in this ROD. For all nine sites (i.e., NPG, Arco High Altitude Bombing Range, Twin Buttes Bombing Range, Experimental Field Station, Fire Station II Zone and Range Fire Burn Area, Land Mine Fuze Burn Area, NOAA, NODA, and STF Gun Range), existing controls such as access restrictions and signs will be maintained until remediation is complete. Long-term institutional control requirements for these sites will be determined based on the analysis of post-remediation confirmation samples.

In accordance with the INEEL Land Use Plan (DOE-ID 1997), DOE will provide institutional controls for sites subject to land-use restrictions until at least 2095, based on the Comprehensive Facility and Land Use Plan, unless a 5-year statutory or periodic remedy review concludes that unrestricted land use is allowable. After year 2095, DOE may no longer manage INEEL activities and controls may take the form of land-use restrictions. Although land use after the year 2095 is highly uncertain, it is likely that industrial applications will continue at the INEEL and WAGs 6 and 10. The Hall Amendment of the National Defense Authorization Act of 1994 (Public Law 103–160) requires concurrence from EPA on the lease of any National Priorities List sites during the period of DOE control, and CERCLA [42 USC 9620 § 120] requires notification to the state of a lease involving contamination. When DOE no longer manages INEEL activities, and controls are needed, CERCLA [42 USC 9620 § 120] requires that DOE document the presence of contamination and any restrictions in property transfer documentation.

Institutional controls will be applied initially to 16 of the 50 sites in OU 10-04 and will not be required for the other 34 sites. A summary of the analysis conducted to identify no action and institutional control sites is presented in Table 33. A preliminary description of the controls that will be applied is provided in Table 34, and the costs estimated for maintaining institutional controls for 100 years are reported in Table 35.

11.2 Waste Area Groups 6 and 10 and Comprehensive INEEL Institutional Control Plan

A comprehensive approach for establishing, implementing, enforcing, and monitoring institutional controls will be developed in accordance with EPA Region 10 policy (EPA 1999b) as part of the Operations and Maintenance (O&M) Plan, an FFA/CO Primary document, during the RD/RA phase. The O&M Plan will be the mechanism for the implementation of institutional controls at WAG 6 and 10 institutional control sites and all INEEL CERCLA sites that require institutional controls. The following elements for the WAG 6 and 10 institutional control plan and the comprehensive INEEL-wide institutional control plan will involve procedures for controlling activities as outlined in the policy:

- A comprehensive listing of all areas or locations in WAGs 6 and 10 and all other areas and locations on the INEEL that have or will have institutional controls for protection of human health or the environment. The information in this list will include, at a minimum, the location of the area, the objectives of the restriction or control, the timeframe for which the restrictions apply, and the tools and procedures that will be applied to implement the restrictions or controls and to evaluate the effectiveness of these restrictions or controls.

- Identification, made legally binding where appropriate, of all entities and persons, including but not limited to, employees, contractors, lessees, agents, licensees, and invitees relevant to the INEEL and WAGs 6 and 10 institutional controls.

- Identification of all activities, and reasonably anticipated future activities, including but not limited to, future soil disturbance, routine and nonroutine utility work, well placement and drilling, grazing activities, groundwater withdrawals, paving, construction, renovation work on structures, or other activities that could occur on INEEL CERCLA sites with institutional controls.

- A tracking mechanism that identifies all land areas under restriction or control.

- A process to promptly notify both the EPA and the State of Idaho before any anticipated change in land-use designation, restriction, land users, or activity for any institutional control required by a decision document.

In addition, the WAGs 6 and 10 and the INEEL-wide comprehensive approach will incorporate by reference the INEEL Land Use Plan (DOE-ID 1997), installation maps, a comprehensive permitting system, and other installation policies and orders.

Table 33. No action sites and sites requiring institutional controls in WAGs 6 and 10.

Site Code[a]	Site Name	No Action[b] or Institutional Controls[c]	Basis for No Action or Institutional Controls	Goals of Institutional Controls
WAG 6				
BORAX-01	BORAX II through V Leach Pond	Institutional controls	The estimated baseline risk for this RI/FS site is 4E-05 for the 100-year future residential scenario from exposure to Cs-137. Risks to the current and 100-year future worker are 2E-04 and 2E-05 respectively, because of external exposure to Cs-137. The leach pond is inactive; however, low-level radionuclide contaminated soil has been buried under clean soil (DOE-ID 2001).	Land use will be restricted to prohibit potential exposure to radiologically contaminated soil. Institutional controls will be maintained until discontinued based on the results of a 5-year review. DOE-ID will notify EPA and the State before any transfer, sale or lease to a non-Federal entity (such as a state or local government or a private person) of any DOE-ID managed real property that is the subject of institutional controls required by a CERCLA decision document, and will discuss with EPA and the State appropriate provisions in the conveyance or lease documents to maintain effective institutional controls.
BORAX-02	BORAX-I Burial Site	Institutional controls	The estimated baseline risk for this RI/FS site is 4E-05 for the 100-year future residential scenario from exposure to Cs-137. Risks to the current and 100-year future worker are 2E-04 and 2E-05 respectively, because of external exposure to Cs-137. Radionuclide contaminated surface soil was consolidated with the reactor vessel and buried in place. BORAX-02 was capped in 1996 and a fence was built around the perimeter of the site.	Maintain land-use controls to inhibit intrusion into the buried waste and radionuclide contaminated soil. Institutional controls will be maintained until discontinued based on the results of a 5-year review. DOE-ID will notify EPA and the State before any transfer, sale or lease to a non-Federal entity (such as a state or local government or a private person) of any DOE-ID managed real property that is the subject of institutional controls required by a CERCLA decision document, and will discuss with EPA and the State appropriate provisions in the conveyance or lease documents to maintain effective institutional controls.
BORAX-03	BORAX Argonne Experimental Facility (AEF) Septic Tank (AEF-703)	No action	Tank was removed during a 1995 decontamination and decommissioning (D&D) action. This site contains no hazardous substances or radiological contamination (DOE-ID 2001).	None
BORAX-04	BORAX Trash Dump	No action	Dump has been inactivated and all waste removed. The site has been covered with clean soil and vegetated.	None
BORAX-05	BORAX Fuel Oil Tank, SW of AEF-602	No action	The Underground Storage Tank (UST) was removed during the 1990 tank program. This site contains no hazardous substances or radiological contamination (DOE-ID 2001).	None
BORAX-07	BORAX Inactive Fuel Oil Tank by AEF-601	No action	The UST was removed during the 1990 tank program. This site contains no hazardous substances or radiological contamination (DOE-ID 2001).	None

Table 33. (continued).

Site Code[a]	Site Name	No Action[b] or Institutional Controls[c]	Basis for No Action or Institutional Controls	Goals of Institutional Controls
BORAX-08	BORAX Ditch	Institutional controls	The estimated baseline risk for this RI/FS site is 4E-05 for the 100-year future residential scenario from exposure to Cs-137. Risks to the current and 100-year future worker are 2E-04 and 2E-05 respectively, because of external exposure to Cs-137. Radionuclide contaminated soil was removed during the 1995 NTCRA (DOE-ID 2001).	Land use will be restricted to prohibit potential exposure to radiologically contaminated soil. Institutional controls will be maintained until discontinued based on the results of a 5-year review. DOE-ID will notify EPA and the State before any transfer, sale or lease to a non-Federal entity (such as a state or local government or a private person) of any DOE-ID managed real property that is the subject of institutional controls required by a CERCLA decision document, and will discuss with EPA and the State appropriate provisions in the conveyance or lease documents to maintain effective institutional controls.
BORAX-09	BORAX II through V	Institutional controls	The estimated baseline risk for this RI/FS site is 4E-05 for the 100-year future residential scenario from exposure to Cs-137. Risks to the current and 100-year future worker are 2E-04 and 2E-05 respectively, because of external exposure to Cs-137. The BORAX-09 reactor was entombed with concrete and buried under clean soil. The chain-link fence on the perimeter of the former reactor building site was left in place (DOE-ID 2001).	Maintain land-use controls to inhibit intrusion into the buried waste and radionuclide contaminated soil. Institutional controls will be maintained until discontinued based on the results of a 5-year review. DOE-ID will notify EPA and the State before any transfer, sale or lease to a non-Federal entity (such as a state or local government or a private person) of any DOE-ID managed real property that is the subject of institutional controls required by a CERCLA decision document, and will discuss with EPA and the State appropriate provisions in the conveyance or lease documents to maintain effective institutional controls.
None	EBR-I Reactor Building Area (including Heat Transfer Reactor Experiment [HTRE])	No action	The EBR-I Reactor Building includes the EBR-601 Reactor Building and Annex, the EBR-602 Security Control House, and the two ANP jet engines displayed outside the EBR-I perimeter fence. EBR-I is a part of a Registered National Historic Landmark to which the public has access. This site is currently an active tourist attraction. The risk issues for the EBR-I site and HTRE assemblies are addressed by current management controls (DOE-ID 2001).	The EBR-I Reactor building will be maintained and operated as a National Historic Landmark into the foreseeable future. If circumstances, such as a natural disaster, rule out the preservation of the site, D&D will be scheduled. The performance standards ensure that the EBR-I Reactor Building Area will not pose an unacceptable cumulative risk following closure. Future assessment and closure will be managed by EBR-I Operations.
EBR-02	EBR-I Septic Tank (AEF-702) and Seepage Pit (AEF-703)	No action	Tank was removed during 1995 D&D action and no evidence of leakage was observed. This site contains no hazardous substances or radiological contamination (DOE-ID 2001).	None
EBR-03	EBR-I Seepage Pit (WMO-702)	No action	Pit removed during 1995 D&D action. The seepage pit does not appear to have received hazardous waste (DOE-ID 2001).	None

Table 33. (continued).

Site Code[a]	Site Name	No Action[b] or Institutional Controls[c]	Basis for No Action or Institutional Controls	Goals of Institutional Controls
EBR-04	EBR-I Septic Tank (WMO-701)	No action	Tank removed during 1995 D&D action, however during removal a radionuclide-contaminated product was discovered in the EBR-04 Septic Tank associated with the EBR-03 Seepage Pit. All detected radionuclides were below INEEL background levels or estimated risk values based on cancer risk levels of 1E-06 (DOE-ID 2001).	None
EBR-05	EBR-I Cesspool, Septic Tank (EBR-709) and Seepage Pit (EBR-713)	No action	EBR-05 is currently an active site in the EBR-I facility. The EBR-I Reactor Building is a historical landmark to which the public has access (DOE-ID 2001).	The EBR-I Reactor building will be maintained and operated as a National Historic Landmark into the foreseeable future. If circumstances, such as a natural disaster, rule out the preservation of the site, D&D will be scheduled. Although not expected, detection of contamination within EBR-05 will be addressed and mitigated at that time. Future assessment and closure will be managed by EBR-I Operations.
EBR-06	EBR-I Septic Tank (EBR-714) and Seepage Pit (EBR-716)	No action	Tank was removed during 1995 D&D action. This site contains no hazardous substances or radiological contamination (DOE-ID 2001).	None
EBR-07	EBR-I (AEF-704) Fuel Oil Tank at AEF-603	No action	The UST was removed during the 1990 tank program. This site contains no hazardous substances or radiological contamination (DOE-ID 2001).	None
EBR-08	EBR-I (WMO-703) Fuel Oil Tank	Institutional controls	The UST was removed during the 1990 tank program. The soil under the UST showed evidence of leakage. The estimated baseline risk for this RI/FS site is 7E-06 for the current residential scenario from exposure to TPH-diesel (DOE-ID 2001).	Restrict the site to industrial land use until discontinued based on the results of a 5-year review.
EBR-09	EBR-I (WMO-704) Fuel Oil Tank at WMO-601	No action	Because of the location of the tank (partially underneath the footing of WMO-601), the tank was grouted in place with cement during the 1995 D&D action. The condition of the tank is unknown and the possible contents are unaccounted for (DOE-ID 2001).	None
EBR-10	EBR-I (WMO-705) Gasoline Tank	No action	The UST was removed during the 1990 tank program. There was some evidence of contaminated soil from diesel fuel. Sample results were evaluated using the Risk –Based Corrective Action (RBCA) model and estimated risk values fell below the cancer risk levels of 1E-06 (DOE-ID 2001).	None

Table 33. (continued).

Site Code[a]	Site Name	No Action[b] or Institutional Controls[c]	Basis for No Action or Institutional Controls	Goals of Institutional Controls
EBR-11	EBR-I Fuel Oil Tank (EBR-706)	No action	The UST was removed during the 1990 tank program. Some diesel fuel soil contamination remains at the site at the excavation depth of 8 to 10 ft; however, sample results fall well beneath the state RBCA action limit (DOE-ID 2001).	None
EBR-12	EBR-I Diesel Tank (EBR-707)	No action	The UST was removed during the 1990 tank program. Some diesel fuel soil contamination remains at the site at the excavation depth of 1 to 9 ft; however, sample results fall well beneath the state RBCA action limit (DOE-ID 2001).	None
EBR-13	EBR-I Gasoline Tank (EBR-708)	No action	The UST was removed during the 1990 tank program. This site contains no hazardous substances or radiological contamination (DOE-ID 2001).	None
EBR-14	EBR-I Gasoline Tank (EBR-717)	No action	The tank was not located and remains unaccounted for (DOE-ID 2001).	None
EBR-15	Radioactive Soil Contamination (EBR-I)	No action	Radioactive contaminated soil was removed in the 1995 NTCRA. Following removal, all detected radionuclides were below INEEL background levels or estimated risk values based on cancer risk levels of 1E-06 (DOE-ID 2001).	None
WAG 10				
ARVFS-01	Army Reentry Vehicle Facility Site (ARVFS) Containers of Contaminated NaK	No action	The NaK was removed during the RCRA action in 1995 (DOE-ID 2001).	None
ARVFS-02	ARVFS Tank Containing Low-level Radioactive Waste (under white building)	No action	The tank was removed during the 1989 D&D action (DOE-ID 2001).	None
CPP-66	Fly Ash Pit	No action	This site was evaluated under OU 10-04 for ecological risks. This site is a no action under CERCLA.	None
DF-1	Dairy Farm Disposal Pit	No action	The pit is inactive and the waste was removed in 1989.	None
EOCR-01	EOCR Leach Pond	No action	This site was never active. This site contains no hazardous substances or radiological contamination (DOE-ID 2001).	None

Table 33. (continued).

Site Code[a]	Site Name	No Action[b] or Institutional Controls[c]	Basis for No Action or Institutional Controls	Goals of Institutional Controls
EOCR-02	EOCR Injection Well	No action	This site was never active. This site contains no hazardous substances or radiological contamination (DOE-ID 2001).	None
EOCR-03	EOCR Oxidation Pond	No action	This site was never active. This site contains no hazardous substances or radiological contamination (DOE-ID 2001).	None
EOCR-04	EOCR Septic Tank	No action	This tank is currently inactive. This site contains no hazardous substances or radiological contamination (DOE-ID 2001).	None
EOCR-05	EOCR Blowdown Sump (EOCR-719)	No action	This site was never active. This site contains no hazardous substances or radiological contamination (DOE-ID 2001).	None
LCCDA-01	LCCDA Old Disposal Pit (west end)	No action	A correction factor was applied to the detected levels of Ra-226 at this site, and resulting concentrations were similar to INEEL background levels. The estimated baseline risk for this RI/FS site is 7E-06 for the 100-year future residential scenario from exposure to Cs-137. Risks to the current and 100-year future worker are 4E-05 and 4E-06 respectively, because of external exposure to Cs-137 (DOE-ID 2001).	None
LCCDA-02	LCCDA Limestone Treatment and Disposal Pit (east end)	No action	A correction factor was applied to the detected levels of Ra-226 at this site, and resulting concentrations were similar to INEEL background levels. The estimated baseline risk for this RI/FS site is 7E-06 for the 100-year future residential scenario from exposure to Cs-137. Risks to the current and 100-year future worker are 4E-05 and 4E-06 respectively, because of external exposure to Cs-137 (DOE-ID 2001).	None

Table 33. (continued).

Site Code[a]	Site Name	No Action[b] or Institutional Controls[c]	Basis for No Action or Institutional Controls	Goals of Institutional Controls
OMRE-01	OMRE Leach Pond	Institutional controls	The estimated baseline risk for this RI/FS site is 9E-05 for the 100-year future residential scenario from exposure to Cs-137. Risks to the current and 100-year future worker are 1E-04 and 2E-05 respectively, because of external exposure to Cs-137 (DOE-ID 2001).	Land use will be restricted to prohibit potential exposure to radiologically contaminated soil. Institutional controls will be maintained until discontinued based on the results of a 5-year review. DOE-ID will notify EPA and the State before any transfer, sale or lease to a non-Federal entity (such as a state or local government or a private person) of any DOE-ID managed real property that is the subject of institutional controls required by a CERCLA decision document, and will discuss with EPA and the State appropriate provisions in the conveyance or lease documents to maintain effective institutional controls.
ORD-01	Arco High Altitude Bombing Range	Institutional Control	There is a potential for UXO to remain in the area. UXO poses a physical risk to human safety through the danger of explosion when it is handled or contacted, especially by machinery.	Restrict sites to industrial land use until remediation is implemented as prescribed in this ROD then, based on analysis of residual risk, determine potential land use. Land-use control after remediation will not be required if it can be confirmed that all UXO is removed; however, confirmation of complete removal may not be possible in allocations, and complete UXO removal may not be practical or feasible in some areas. As determined by post-remediation risk analysis, land-use restrictions will be established and maintained as required for areas that potentially pose a threat from UXO contact. Institutional controls will be maintained until residual risk is removed or reduced to acceptable levels based on the results of a 5-year review. DOE-ID will notify EPA and the State before any transfer, sale or lease to a non-Federal entity (such as a state or local government or a private person) of any DOE-ID managed real property that is the subject of institutional controls required by a CERCLA decision document, and will discuss with EPA and the State appropriate provisions in the conveyance or lease documents to maintain effective institutional controls.
ORD-02	Naval Ordnance Test Facility	No action	No UXO or soil contamination has been found in this area (DOE-ID 2001).	None

Table 33. (continued).

Site Code[a]	Site Name	No Action[b] or Institutional Controls[c]	Basis for No Action or Institutional Controls	Goals of Institutional Controls
ORD-03	CFA-633 Naval Firing Site and Downrange Area	Institutional controls	There is a potential for UXO to remain in the area. UXO poses a physical risk to human safety through the danger of explosion when it is handled or contacted, especially by machinery.	Restrict sites to industrial land use until remediation is implemented as prescribed in this ROD then, based on analysis of residual risk, determine potential land use. Land-use control after remediation will not be required if it can be confirmed that all UXO is removed; however, confirmation of complete removal may not be possible in all locations, and complete UXO removal may not be practical or feasible in some areas. As determined by post-remediation risk analysis, land-use restrictions will be established and maintained as required for areas that potentially pose a threat from UXO contact. Institutional controls will be maintained until residual risk is removed or reduced to acceptable levels based on the results of a 5-year review. DOE-ID will notify EPA and the State before any transfer, sale or lease to a non-Federal entity (such as a state or local government or a private person) of any DOE-ID managed real property that is the subject of institutional controls required by a CERCLA decision document, and will discuss with EPA and the State appropriate provisions in the conveyance or lease documents to maintain effective institutional controls.

Table 33. (continued).

Site Code[a]	Site Name	No Action[b] or Institutional Controls[c]	Basis for No Action or Institutional Controls	Goals of Institutional Controls
ORD-04	CFA Gravel Pit	Institutional controls	There is a potential for UXO to remain in the area. UXO poses a physical risk to human safety through the danger of explosion when it is handled or contacted, especially by machinery.	Restrict sites to industrial land use until remediation is implemented as prescribed in this ROD then, based on analysis of residual risk, determine potential land use. Land-use control after remediation will not be required if it can be confirmed that all UXO is removed; however, confirmation of complete removal may not be possible in all locations, and complete UXO removal may not be practical or feasible in some areas. As determined by post-remediation risk analysis, land-use restrictions will be established and maintained as required for areas that potentially pose a threat from UXO contact. Institutional controls will be maintained until residual risk is removed or reduced to acceptable levels based on the results of a 5-year review. DOE-ID will notify EPA and the State before any transfer, sale or lease to a non-Federal entity (such as a state or local government or a private person) of any DOE-ID managed real property that is the subject of institutional controls required by a CERCLA decision document, and will discuss with EPA and the State appropriate provisions in the conveyance or lease documents to maintain effective institutional controls.

Table 33. (continued).

Site Code[a]	Site Name	No Action[b] or Institutional Controls[c]	Basis for No Action or Institutional Controls	Goals of Institutional Controls
ORD-05	CFA Sanitary Landfill Area	Institutional controls	There is a potential for UXO to remain in the area. UXO poses a physical risk to human safety through the danger of explosion when it is handled or contacted, especially by machinery.	Restrict sites to industrial land use until remediation is implemented as prescribed in this ROD then, based on analysis of residual risk, determine potential land use. Land-use control after remediation will not be required if it can be confirmed that all UXO is removed; however, confirmation of complete removal may not be possible in all locations, and complete UXO removal may not be practical or feasible in some areas. As determined by post-remediation risk analysis, land-use restrictions will be established and maintained as required for areas that potentially pose a threat from UXO contact. Institutional controls will be maintained until residual risk is removed or reduced to acceptable levels based on the results of a 5-year review. DOE-ID will notify EPA and the State before any transfer, sale or lease to a non-Federal entity (such as a state or local government or a private person) of any DOE-ID managed real property that is the subject of institutional controls required by a CERCLA decision document, and will discuss with EPA and the State appropriate provisions in the conveyance or lease documents to maintain effective institutional controls.

Table 33. (continued).

Site Code[a]	Site Name	No Action[b] or Institutional Controls[c]	Basis for No Action or Institutional Controls	Goals of Institutional Controls
ORD-06	Naval Ordnance Disposal Area	Institutional controls	The estimated baseline risk for NODA is 2E-02 for the 100-year future residential scenario from exposure to RDX. Risks to the current and 100-year future worker are 4E-05 and 4E-05 respectively, because of exposure to RDX (DOE-ID 2001). There is a potential for UXO to remain in the area. UXO poses a physical risk to human safety through the danger of explosion when it is handled or contacted, especially by machinery.	Restrict the site to industrial land use until remediation is implemented as prescribed in this ROD then, based on analysis of residual risk, determine potential land use. Land-use control will not be required after remediation if all TNT/RDX fragments and contaminated soil above the final remediation goal are removed, and it can be confirmed that all UXO is removed. However, remediation may not be 100% effective, and buried, undetected TNT/RDX fragments may remain at the site. Also, confirmation of complete UXO removal may not be possible in all locations, and complete UXO removal may not be practical or feasible in some area. As determined by post-remediation risk analysis, land-use restrictions will be established and maintained as required for areas that potentially pose a threat from buried, undetected TNT/RDX and/or UXO. Institutional controls will be maintained until residual risk is removed or reduced to acceptable levels based on the results of a 5-year review. DOE-ID will notify EPA and the State before any transfer, sale or lease to a non-Federal entity (such as a state or local government or a private person) of any DOE-ID managed real property that is the subject of institutional controls required by a CERCLA decision document, and will discuss with EPA and the State appropriate provisions in the conveyance or lease documents to maintain effective institutional controls.

Table 33. (continued).

Site Code[a]	Site Name	No Action[b] or Institutional Controls[c]	Basis for No Action or Institutional Controls	Goals of Institutional Controls
ORD-07	Explosive Storage Bunkers – North of INTEC	Institutional controls	There is a potential for UXO to remain in the area. UXO poses a physical risk to human safety through the danger of explosion when it is handled or contacted, especially by machinery.	Restrict sites to industrial land use until remediation is implemented as prescribed in this ROD then, based on analysis of residual risk, determine potential land use. Land-use control after remediation will not be required if it can be confirmed that all UXO is removed; however, confirmation of complete removal may not be possible in all locations, and complete UXO removal may not be practical or feasible in some areas. As determined by post-remediation risk analysis, land-use restrictions will be established and maintained as required for areas that potentially pose a threat from UXO contact. Institutional controls will be maintained until residual risk is removed or reduced to acceptable levels based on the results of a 5-year review. DOE-ID will notify EPA and the State before any transfer, sale or lease to a non-Federal entity (such as a state or local government or a private person) of any DOE-ID managed real property that is the subject of institutional controls required by a CERCLA decision document, and will discuss with EPA and the State appropriate provisions in the conveyance or lease documents to maintain effective institutional controls.

Table 33. (continued).

Site Code[a]	Site Name	No Action[b] or Institutional Controls[c]	Basis for No Action or Institutional Controls	Goals of Institutional Controls
ORD-08	National Oceanic and Atmospheric Administration	Institutional control	The estimated baseline risk for NODA is 1E-03 for the 100-year future residential scenario from exposure to TNT and RDX. Risks to the current and 100-year future worker are 2E-04 and 2E-04 respectively, because of exposure to TNT and RDX (DOE-ID 2001). There is a potential for UXO to remain in the area. UXO poses a physical risk to human safety through the danger of explosion when it is handled or contacted, especially by machinery.	Restrict the site to industrial land use until remediation is implemented as prescribed in this ROD then, based on analysis of residual risk, determine potential land use. Land-use control will not be required after remediation if all TNT/RDX fragments and contaminated soil above the final remediation goal are removed, and it can be confirmed that all UXO is removed. However, remediation may not be 100% effective, and buried, undetected TNT/RDX fragments may remain at the site. Also, confirmation of complete UXO removal may not be possible in all locations, and complete UXO removal may not be practical or feasible in some area. As determined by post-remediation risk analysis, land-use restrictions will be established and maintained as required for areas that potentially pose a threat from buried, undetected TNT/RDX and/or UXO. Institutional controls will be maintained until residual risk is removed or reduced to acceptable levels based on the results of a 5-year review. DOE-ID will notify EPA and the State before any transfer, sale or lease to a non-Federal entity (such as a state or local government or a private person) of any DOE-ID managed real property that is the subject of institutional controls required by a CERCLA decision document, and will discuss with EPA and the State appropriate provisions in the conveyance or lease documents to maintain effective institutional controls.

Table 33. (continued).

Site Code[a]	Site Name	No Action[b] or Institutional Controls[c]	Basis for No Action or Institutional Controls	Goals of Institutional Controls
ORD-09	Twin Buttes Bombing Range	Institutional controls	There is a potential for UXO to remain in the area. UXO poses a physical risk to human safety through the danger of explosion when it is handled or contacted, especially by machinery.	Restrict sites to industrial land use until remediation is implemented as prescribed in this ROD then, based on analysis of residual risk, determine potential land use. Land-use control after remediation will not be required if it can be confirmed that all UXO is removed; however, confirmation of complete removal may not be possible in all locations, and complete UXO removal may not be practical or feasible in some areas. As determined by post-remediation risk analysis, land-use restrictions will be established and maintained as required for areas that potentially pose a threat from UXO contact. Institutional controls will be maintained until residual risk is removed or reduced to acceptable levels based on the results of a 5-year review. DOE-ID will notify EPA and the State before any transfer, sale or lease to a non-Federal entity (such as a state or local government or a private person) of any DOE-ID managed real property that is the subject of institutional controls required by a CERCLA decision document, and will discuss with EPA and the State appropriate provisions in the conveyance or lease documents to maintain effective institutional controls.

Table 33. (continued).

Site Code[a]	Site Name	No Action[b] or Institutional Controls[c]	Basis for No Action or Institutional Controls	Goals of Institutional Controls
ORD-10	Fire Station II Zone and Range Fire Burn Area	Institutional controls	The estimated baseline risk for this RI/FS site is 1E-04 for the 100-year future residential scenario from exposure to TNT and RDX. Risks to the current and 100-year future worker are 2E-05 and 2E-05 respectively, because of exposure to TNT and RDX (DOE-ID 2001). There is a potential for UXO to remain in the area. UXO poses a physical risk to human safety through the danger of explosion when it is handled or contacted, especially by machinery.	Restrict the site to industrial land use until remediation is implemented as prescribed in this ROD then, based on analysis of residual risk, determine potential land use. Land-use control will not be required after remediation if all TNT/RDX fragments and contaminated soil above the final remediation goal are removed, and it can be confirmed that all UXO is removed. However, remediation may not be 100% effective, and buried, undetected TNT/RDX fragments may remain at the site. Also, confirmation of complete UXO removal may not be possible in all locations, and complete UXO removal may not be practical or feasible in some area. As determined by post-remediation risk analysis, land-use restrictions will be established and maintained as required for areas that potentially pose a threat from buried, undetected TNT/RDX and/or UXO. Institutional controls will be maintained until residual risk is removed or reduced to acceptable levels based on the results of a 5-year review. DOE-ID will notify EPA and the State before any transfer, sale or lease to a non-Federal entity (such as a state or local government or a private person) of any DOE-ID managed real property that is the subject of institutional controls required by a CERCLA decision document, and will discuss with EPA and the State appropriate provisions in the conveyance or lease documents to maintain effective institutional controls.

Table 33. (continued).

Site Code[a]	Site Name	No Action[b] or Institutional Controls[c]	Basis for No Action or Institutional Controls	Goals of Institutional Controls
ORD-11	Anaconda Power Line	Institutional control	There is a potential for UXO to remain in the area. UXO poses a physical risk to human safety through the danger of explosion when it is handled or contacted, especially by machinery.	Restrict sites to industrial land use until remediation is implemented as prescribed in this ROD then, based on analysis of residual risk, determine potential land use. Land-use control after remediation will not be required if it can be confirmed that all UXO is removed; however, confirmation of complete removal may not be possible in all locations, and complete UXO removal may not be practical or feasible in some areas. As determined by post-remediation risk analysis, land-use restrictions will be established and maintained as required for areas that potentially pose a threat from UXO contact. Institutional controls will be maintained until residual risk is removed or reduced to acceptable levels based on the results of a 5-year review. DOE-ID will notify EPA and the State before any transfer, sale or lease to a non-Federal entity (such as a state or local government or a private person) of any DOE-ID managed real property that is the subject of institutional controls required by a CERCLA decision document, and will discuss with EPA and the State appropriate provisions in the conveyance or lease documents to maintain effective institutional controls.

Table 33. (continued).

Site Code[a]	Site Name	No Action[b] or Institutional Controls[c]	Basis for No Action or Institutional Controls	Goals of Institutional Controls
ORD-12	Old Military Structures	Institutional controls	There is a potential for UXO to remain in the area. UXO poses a physical risk to human safety through the danger of explosion when it is handled or contacted, especially by machinery.	Restrict sites to industrial land use until remediation is implemented as prescribed in this ROD then, based on analysis of residual risk, determine potential land use. Land-use control after remediation will not be required if it can be confirmed that all UXO is removed; however, confirmation of complete removal may not be possible in all locations, and complete UXO removal may not be practical or feasible in some areas. As determined by post-remediation risk analysis, land-use restrictions will be established and maintained as required for areas that potentially pose a threat from UXO contact. Institutional controls will be maintained until residual risk is removed or reduced to acceptable levels based on the results of a 5-year review. DOE-ID will notify EPA and the State before any transfer, sale or lease to a non-Federal entity (such as a state or local government or a private person) of any DOE-ID managed real property that is the subject of institutional controls required by a CERCLA decision document, and will discuss with EPA and the State appropriate provisions in the conveyance or lease documents to maintain effective institutional controls.

Table 33. (continued).

Site Code[a]	Site Name	No Action[b] or Institutional Controls[c]	Basis for No Action or Institutional Controls	Goals of Institutional Controls
ORD-13	Mass Detonation Area	Institutional controls	There is a potential for UXO to remain in the area. UXO poses a physical risk to human safety through the danger of explosion when it is handled or contacted, especially by machinery.	Restrict sites to industrial land use until remediation is implemented as prescribed in this ROD then, based on analysis of residual risk, determine potential land use. Land-use control after remediation will not be required if it can be confirmed that all UXO is removed; however, confirmation of complete removal may not be possible in all locations, and complete UXO removal may not be practical or feasible in some areas. As determined by post-remediation risk analysis, land-use restrictions will be established and maintained as required for areas that potentially pose a threat from UXO contact. Institutional controls will be maintained until residual risk is removed or reduced to acceptable levels based on the results of a 5-year review. DOE-ID will notify EPA and the State before any transfer, sale or lease to a non-Federal entity (such as a state or local government or a private person) of any DOE-ID managed real property that is the subject of institutional controls required by a CERCLA decision document, and will discuss with EPA and the State appropriate provisions in the conveyance or lease documents to maintain effective institutional controls.

Table 33. (continued).

Site Code[a]	Site Name	No Action[b] or Institutional Controls[c]	Basis for No Action or Institutional Controls	Goals of Institutional Controls
ORD-14	Dairy Farm Revetments	Institutional controls	There is a potential for UXO to remain in the area. UXO poses a physical risk to human safety through the danger of explosion when it is handled or contacted, especially by machinery.	Restrict sites to industrial land use until remediation is implemented as prescribed in this ROD then, based on analysis of residual risk, determine potential land use. Land-use control after remediation will not be required if it can be confirmed that all UXO is removed; however, confirmation of complete removal may not be possible in all locations, and complete UXO removal may not be practical or feasible in some areas. As determined by post-remediation risk analysis, land-use restrictions will be established and maintained as required for areas that potentially pose a threat from UXO contact. Institutional controls will be maintained until residual risk is removed or reduced to acceptable levels based on the results of a 5-year review. DOE-ID will notify EPA and the State before any transfer, sale or lease to a non-Federal entity (such as a state or local government or a private person) of any DOE-ID managed real property that is the subject of institutional controls required by a CERCLA decision document, and will discuss with EPA and the State appropriate provisions in the conveyance or lease documents to maintain effective institutional controls.

Table 33. (continued).

Site Code[a]	Site Name	No Action[b] or Institutional Controls[c]	Basis for No Action or Institutional Controls	Goals of Institutional Controls
ORD-15	Experimental Field Station	Institutional controls	The estimated baseline risk for this RI/FS site is 9E-05 (with a hazard quotient of 10) for the 100-year future residential scenario from exposure to TNT. Risks to the current and 100-year future worker are 6E-05 and 6E-05 respectively, because of exposure to TNT (DOE-ID 2001). There is a potential for UXO to remain in the area. UXO poses a physical risk to human safety through the danger of explosion when it is handled or contacted, especially by machinery.	Restrict the site to industrial land use until remediation is implemented as prescribed in this ROD then, based on analysis of residual risk, determine potential land use. Land-use control will not be required after remediation if all TNT/RDX fragments and contaminated soil above the final remediation goal are removed, and it can be confirmed that all UXO is removed. However, remediation may not be 100% effective, and buried, undetected TNT/RDX fragments may remain at the site. Also, confirmation of complete UXO removal may not be possible in all locations, and complete UXO removal may not be practical or feasible in some area. As determined by post-remediation risk analysis, land-use restrictions will be established and maintained as required for areas that potentially pose a threat from buried, undetected TNT/RDX and/or UXO. Institutional controls will be maintained until residual risk is removed or reduced to acceptable levels based on the results of a 5-year review. DOE-ID will notify EPA and the State before any transfer, sale or lease to a non-Federal entity (such as a state or local government or a private person) of any DOE-ID managed real property that is the subject of institutional controls required by a CERCLA decision document, and will discuss with EPA and the State appropriate provisions in the conveyance or lease documents to maintain effective institutional controls.

Table 33. (continued).

Site Code[a]	Site Name	No Action[b] or Institutional Controls[c]	Basis for No Action or Institutional Controls	Goals of Institutional Controls
ORD-16	UXO East of TRA	Institutional controls	There is a potential for UXO to remain in the area. UXO poses a physical risk to human safety through the danger of explosion when it is handled or contacted, especially by machinery.	Restrict sites to industrial land use until remediation is implemented as prescribed in this ROD then, based on analysis of residual risk, determine potential land use. Land-use control after remediation will not be required if it can be confirmed that all UXO is removed; however, confirmation of complete removal may not be possible in all locations, and complete UXO removal may not be practical or feasible in some areas. As determined by post-remediation risk analysis, land-use restrictions will be established and maintained as required for areas that potentially pose a threat from UXO contact. Institutional controls will be maintained until residual risk is removed or reduced to acceptable levels based on the results of a 5-year review. DOE-ID will notify EPA and the State before any transfer, sale or lease to a non-Federal entity (such as a state or local government or a private person) of any DOE-ID managed real property that is the subject of institutional controls required by a CERCLA decision document, and will discuss with EPA and the State appropriate provisions in the conveyance or lease documents to maintain effective institutional controls.

Table 33. (continued).

Site Code[a]	Site Name	No Action[b] or Institutional Controls[c]	Basis for No Action or Institutional Controls	Goals of Institutional Controls
ORD-17	Burn-Ring South of Experimental Field Station	Institutional controls	This site is located in the NPG where there is a potential for UXO to remain. UXO poses a physical risk to human safety through the danger of explosion when it is handled or contacted, especially by machinery.	Restrict sites to industrial land use until remediation is implemented as prescribed in this ROD then, based on analysis of residual risk, determine potential land use. Land-use control after remediation will not be required if it can be confirmed that all UXO is removed; however, confirmation of complete removal may not be possible in all locations, and complete UXO removal may not be practical or feasible in some areas. As determined by post-remediation risk analysis, land-use restrictions will be established and maintained as required for areas that potentially pose a threat from UXO contact. Institutional controls will be maintained until residual risk is removed or reduced to acceptable levels based on the results of a 5-year review. DOE-ID will notify EPA and the State before any transfer, sale or lease to a non-Federal entity (such as a state or local government or a private person) of any DOE-ID managed real property that is the subject of institutional controls required by a CERCLA decision document, and will discuss with EPA and the State appropriate provisions in the conveyance or lease documents to maintain effective institutional controls.

Table 33. (continued).

Site Code[a]	Site Name	No Action[b] or Institutional Controls[c]	Basis for No Action or Institutional Controls	Goals of Institutional Controls
ORD-18	Igloo-Type Structures Northwest of Experimental Field Station	Institutional controls	There is a potential for UXO to remain in the area. UXO poses a physical risk to human safety through the danger of explosion when it is handled or contacted, especially by machinery.	Restrict sites to industrial land use until remediation is implemented as prescribed in this ROD then, based on analysis of residual risk, determine potential land use. Land-use control after remediation will not be required if it can be confirmed that all UXO is removed; however, confirmation of complete removal may not be possible in all locations, and complete UXO removal may not be practical or feasible in some areas. As determined by post-remediation risk analysis, land-use restrictions will be established and maintained as required for areas that potentially pose a threat from UXO contact. Institutional controls will be maintained until residual risk is removed or reduced to acceptable levels based on the results of a 5-year review. DOE-ID will notify EPA and the State before any transfer, sale or lease to a non-Federal entity (such as a state or local government or a private person) of any DOE-ID managed real property that is the subject of institutional controls required by a CERCLA decision document, and will discuss with EPA and the State appropriate provisions in the conveyance or lease documents to maintain effective institutional controls.

Table 33. (continued).

Site Code[a]	Site Name	No Action[b] or Institutional Controls[c]	Basis for No Action or Institutional Controls	Goals of Institutional Controls
ORD-19	Rail Car Explosion Area	Institutional controls	There is a potential for UXO to remain in the area. UXO poses a physical risk to human safety through the danger of explosion when it is handled or contacted, especially by machinery.	Restrict sites to industrial land use until remediation is implemented as prescribed in this ROD then, based on analysis of residual risk, determine potential land use. Land-use control after remediation will not be required if it can be confirmed that all UXO is removed; however, confirmation of complete removal may not be possible in all locations, and complete UXO removal may not be practical or feasible in some areas. As determined by post-remediation risk analysis, land-use restrictions will be established and maintained as required for areas that potentially pose a threat from UXO contact. Institutional controls will be maintained until residual risk is removed or reduced to acceptable levels based on the results of a 5-year review. DOE-ID will notify EPA and the State before any transfer, sale or lease to a non-Federal entity (such as a state or local government or a private person) of any DOE-ID managed real property that is the subject of institutional controls required by a CERCLA decision document, and will discuss with EPA and the State appropriate provisions in the conveyance or lease documents to maintain effective institutional controls.

Table 33. (continued).

Site Code[a]	Site Name	No Action[b] or Institutional Controls[c]	Basis for No Action or Institutional Controls	Goals of Institutional Controls
ORD-20	UXO East of ARVFS	Institutional controls	There is a potential for UXO to remain in the area. UXO poses a physical risk to human safety through the danger of explosion when it is handled or contacted, especially by machinery.	Restrict sites to industrial land use until remediation is implemented as prescribed in this ROD then, based on analysis of residual risk, determine potential land use. Land-use control after remediation will not be required if it can be confirmed that all UXO is removed; however, confirmation of complete removal may not be possible in all locations, and complete UXO removal may not be practical or feasible in some areas. As determined by post-remediation risk analysis, land-use restrictions will be established and maintained as required for areas that potentially pose a threat from UXO contact. Institutional controls will be maintained until residual risk is removed or reduced to acceptable levels based on the results of a 5-year review. DOE-ID will notify EPA and the State before any transfer, sale or lease to a non-Federal entity (such as a state or local government or a private person) of any DOE-ID managed real property that is the subject of institutional controls required by a CERCLA decision document, and will discuss with EPA and the State appropriate provisions in the conveyance or lease documents to maintain effective institutional controls.
ORD-21	Juniper Mine	Institutional controls	An estimated 16,000 pounds of explosive material remain buried 135 ft below ground (DOE-ID 2001). However, there is significant uncertainty as to the explosive characteristics of this material now (buried in 1974).	Maintain land use controls to inhibit intrusion into the buried explosive material. Institutional controls will be maintained until discontinued based on the results of a 5-year review. DOE-ID will notify EPA and the State before any transfer, sale or lease to a non-Federal entity (such as a state or local government or a private person) of any DOE-ID managed real property that is the subject of institutional controls required by a CERCLA decision document, and will discuss with EPA and the State appropriate provisions in the conveyance or lease documents to maintain effective institutional controls.

Table 33. (continued).

Site Code[a]	Site Name	No Action[b] or Institutional Controls[c]	Basis for No Action or Institutional Controls	Goals of Institutional Controls
ORD-22	Projectiles Found Near Mile Markers 17 and 19	Institutional controls	There is a potential for UXO to remain in the area. UXO poses a physical risk to human safety through the danger of explosion when it is handled or contacted, especially by machinery.	Restrict sites to industrial land use until remediation is implemented as prescribed in this ROD then, based on analysis of residual risk, determine potential land use. Land-use control after remediation will not be required if it can be confirmed that all UXO is removed; however, confirmation of complete removal may not be possible in all locations, and complete UXO removal may not be practical or feasible in some areas. As determined by post-remediation risk analysis, land-use restrictions will be established and maintained as required for areas that potentially pose a threat from UXO contact. Institutional controls will be maintained until residual risk is removed or reduced to acceptable levels based on the results of a 5-year review. DOE-ID will notify EPA and the State before any transfer, sale or lease to a non-Federal entity (such as a state or local government or a private person) of any DOE-ID managed real property that is the subject of institutional controls required by a CERCLA decision document, and will discuss with EPA and the State appropriate provisions in the conveyance or lease documents to maintain effective institutional controls.
ORD-23	Rifle Range	No action	No UXO or soil contamination has been found in this area (DOE-ID 2001).	None

Table 33. (continued).

Site Code[a]	Site Name	No Action[b] or Institutional Controls[c]	Basis for No Action or Institutional Controls	Goals of Institutional Controls
ORD-24	Land Mine Fuze Burn Area	Institutional controls	The estimated baseline risk for this RI/FS site is 6E-03 for the 100-year future residential scenario from exposure to TNT. Risks to the current and 100-year future worker are 4E-03 and 4E-03 respectively, because of exposure to TNT (DOE-ID 2001). There is a potential for UXO to remain in the area. UXO poses a physical risk to human safety through the danger of explosion when it is handled or contacted, especially by machinery.	Restrict the site to industrial land use until remediation is implemented as prescribed in this ROD then, based on analysis of residual risk, determine potential land use. Land-use control will not be required after remediation if all TNT/RDX fragments and contaminated soil above the final remediation goal are removed, and it can be confirmed that all UXO is removed. However, remediation may not be 100% effective, and buried, undetected TNT/RDX fragments may remain at the site. Also, confirmation of complete UXO removal may not be possible in all locations, and complete UXO removal may not be practical or feasible in some area. As determined by post-remediation risk analysis, land-use restrictions will be established and maintained as required for areas that potentially pose a threat from buried, undetected TNT/RDX and/or UXO. Institutional controls will be maintained until residual risk is removed or reduced to acceptable levels based on the results of a 5-year review. DOE-ID will notify EPA and the State before any transfer, sale or lease to a non-Federal entity (such as a state or local government or a private person) of any DOE-ID managed real property that is the subject of institutional controls required by a CERCLA decision document, and will discuss with EPA and the State appropriate provisions in the conveyance or lease documents to maintain effective institutional controls.

Table 33. (continued).

Site Code[a]	Site Name	No Action[b] or Institutional Controls[c]	Basis for No Action or Institutional Controls	Goals of Institutional Controls
ORD-25	Ordnance & Dry Explosives East of the Big Lost River (This site is the same site as the Rail Car Explosion Area)	Institutional controls	There is a potential for UXO to remain in the area. UXO poses a physical risk to human safety through the danger of explosion when it is handled or contacted, especially by machinery.	Restrict sites to industrial land use until remediation is implemented as prescribed in this ROD then, based on analysis of residual risk, determine potential land use. Land-use control after remediation will not be required if it can be confirmed that all UXO is removed; however, confirmation of complete removal may not be possible in all locations, and complete UXO removal may not be practical or feasible in some areas. As determined by post-remediation risk analysis, land-use restrictions will be established and maintained as required for areas that potentially pose a threat from UXO contact. Institutional controls will be maintained until residual risk is removed or reduced to acceptable levels based on the results of a 5-year review. DOE-ID will notify EPA and the State before any transfer, sale or lease to a non-Federal entity (such as a state or local government or a private person) of any DOE-ID managed real property that is the subject of institutional controls required by a CERCLA decision document, and will discuss with EPA and the State appropriate provisions in the conveyance or lease documents to maintain effective institutional controls.

Table 33. (continued).

Site Code[a]	Site Name	No Action[b] or Institutional Controls[c]	Basis for No Action or Institutional Controls	Goals of Institutional Controls
ORD-26	Zone East of the Big Lost River	Institutional controls	There is a potential for UXO to remain in the area. UXO poses a physical risk to human safety through the danger of explosion when it is handled or contacted, especially by machinery.	Restrict sites to industrial land use until remediation is implemented as prescribed in this ROD then, based on analysis of residual risk, determine potential land use. Land-use control after remediation will not be required if it can be confirmed that all UXO is removed; however, confirmation of complete removal may not be possible in all locations, and complete UXO removal may not be practical or feasible in some areas. As determined by post-remediation risk analysis, land-use restrictions will be established and maintained as required for areas that potentially pose a threat from UXO contact. Institutional controls will be maintained until residual risk is removed or reduced to acceptable levels based on the results of a 5-year review. DOE-ID will notify EPA and the State before any transfer, sale or lease to a non-Federal entity (such as a state or local government or a private person) of any DOE-ID managed real property that is the subject of institutional controls required by a CERCLA decision document, and will discuss with EPA and the State appropriate provisions in the conveyance or lease documents to maintain effective institutional controls.

Table 33. (continued).

Site Code[a]	Site Name	No Action[b] or Institutional Controls[c]	Basis for No Action or Institutional Controls	Goals of Institutional Controls
ORD-27	Dirt Mounds Near the Experimental Field Station, NOAA, and NRF	Institutional controls	There is a potential for UXO to remain in the area. UXO poses a physical risk to human safety through the danger of explosion when it is handled or contacted, especially by machinery.	Restrict sites to industrial land use until remediation is implemented as prescribed in this ROD then, based on analysis of residual risk, determine potential land use. Land-use control after remediation will not be required if it can be confirmed that all UXO is removed; however, confirmation of complete removal may not be possible in all locations, and complete UXO removal may not be practical or feasible in some areas. As determined by post-remediation risk analysis, land-use restrictions will be established and maintained as required for areas that potentially pose a threat from UXO contact. Institutional controls will be maintained until residual risk is removed or reduced to acceptable levels based on the results of a 5-year review. DOE-ID will notify EPA and the State before any transfer, sale or lease to a non-Federal entity (such as a state or local government or a private person) of any DOE-ID managed real property that is the subject of institutional controls required by a CERCLA decision document, and will discuss with EPA and the State appropriate provisions in the conveyance or lease documents to maintain effective institutional controls.

Table 33. (continued).

Site Code[a]	Site Name	No Action[b] or Institutional Controls[c]	Basis for No Action or Institutional Controls	Goals of Institutional Controls
ORD-28	Craters East of INTEC	Institutional controls	There is a potential for UXO to remain in the area. UXO poses a physical risk to human safety through the danger of explosion when it is handled or contacted, especially by machinery.	Restrict sites to industrial land-use until remediation is implemented as prescribed in this ROD then, based on analysis of residual risk, determine potential land-use. Land-use control after remediation will not be required if it can be confirmed that all UXO is removed; however, confirmation of complete removal may not be possible in all locations, and complete UXO removal may not be practical or feasible in some areas. As determined by post-remediation risk analysis, land-use restrictions will be established and maintained as required for areas that potentially pose a threat from UXO contact. Institutional controls will be maintained until residual risk is removed or reduced to acceptable levels based on the results of a 5-year review. DOE-ID will notify EPA and the State before any transfer, sale or lease to a non-Federal entity (such as a state or local government or a private person) of any DOE-ID managed real property that is the subject of institutional controls required by a CERCLA decision document, and will discuss with EPA and the State appropriate provisions in the conveyance or lease documents to maintain effective institutional controls.
ORD-29	Big Southern Butte	No action	No live rounds were fired at this site. It is unexpected for UXO to be located within this area (DOE-ID 2001).	None
STF-01	STF-601 Sumps and Pits	No action	The contaminated media from this site were removed during D&D activities (DOE-ID-2001).	None
STF-02	STF Gun Range	Institutional controls	Risk values were not calculated for this site because the maximum detected value for lead, 24,400 mg/kg (average concentration was 1,303 mg/kg), was well above the EPA Region 9 lead PRG of 400 mg/kg, thus, indicating that the site presented an obvious risk (DOE-ID 2001).	Restrict the site to industrial land use until remediation is implemented as prescribed in this ROD, then reevaluate requirements. All contamination above the final remediation goal will be removed during remedial efforts. Thus, monitoring will not be required following remediation and the need for institutional controls or land-use controls are not anticipated.
None	Telecommunication Cable	No action	The cable was cut and rendered useless in the spring of 1990 when U.S. West installed a new fiber optic replacement cable. There is insignificant risk associated with the buried cable in its present state. It is expected that the cable will not be removed but left in place indefinitely (DOE-ID 2001).	None

Table 33. (continued).

Site Code[a]	Site Name	No Action[b] or Institutional Controls[c]	Basis for No Action or Institutional Controls	Goals of Institutional Controls
ZPPR-01	Zero Power Physics Reactor (ZPPR) Disposal Pit (outside ANL-W fence)	No action	This disposal pit is currently inactive. It was used to dispose of excess fill rock, dirt, and small amounts of concrete, asphalt, rebar, and wood. There is no evidence of hazardous materials being disposed (DOE-ID 1999).	None

Hazardous substances and radiological contamination are both mentioned specifically because the Resource Conservation and Liability Act (42 USC 6901 et seq.), which identifies and classifies hazardous contaminants, does not address radioactivity. Both chemical and radiological contaminants can be addressed under the Comprehensive Environmental Response, Compensation, and Liability Act (42 USC 9601 et seq.).

a. The site codes BORAX-06 and EBR-01 were not assigned.

b. Unrestricted land use can be allowed for no action sites, and 5-year reviews are not required.

c. Unless specified otherwise, land use will be restricted at each institutional control site until discontinued based on the results of a 5-year review. According to DOE land-use projections (DOE-ID 1997), DOE control is anticipated until 2095.

Table 34. Institutional control requirements for WAGs 6 and 10.

Timeframe	Land Restriction[a]	Exposure Concern	Objective	Controls	Regulatory Basis or Authority
Site BORAX –02, BORAX-I Burial Site.[b] The site is the former location of the BORAX-I reactor. The facility was deliberately destroyed in July of 1954. Following the excursion, the remaining aboveground structures were removed and the reactor was buried in place along with surrounding radionuclide-contaminated soil. An engineered barrier was constructed over the site. Current occupational scenario risk estimates are greater than 1E-04.					
Current DOE operations	Burial site—no unauthorized intrusion into capped area	Radionuclides—exposure to subsurface soil and buried waste	Maintain integrity of containment barrier	1. Visible access restrictions (warning signs) 2. Control of activities (drilling or excavating)	*Federal Facility Agreement and Consent Order* (FFA/CO) (DOE-ID 1991) Worker protection (10 CFR 835) Radiation protection of the public and as low as reasonably achievable principles (DOE Order 5400.5) National Oil and Hazardous Substances Pollution Control Plan (40 CFR Part 300) CERCLA [42 USC 9620 § 120]
DOE control post operations (i.e., after operations cease and before DOE institutional controls are terminated)	Burial site—no unauthorized intrusion into capped area	Radionuclides—exposure to subsurface soil and buried waste	Maintain integrity of containment barrier	1. Visible access restrictions (warning signs) 2. Control of activities (drilling or excavating) 3. Property lease requirements including control of land use consistent with the OU 10-04 ROD	FFA/CO (DOE-ID 1991) CERCLA [42 USC 9620 § 120(h)(5)][c] Hall Amendment of the National Defense Authorization Act (Public Law 103–160)[c] Property release restrictions (DOE Order 5400.5)

Table 34. (continued).

Timeframe	Land Restriction[a]	Exposure Concern	Objective	Controls	Regulatory Basis or Authority
Post DOE control	Burial site—no unauthorized intrusion into capped area	Radionuclides—exposure to subsurface soil and buried waste	Maintain integrity of containment barrier	Property transfer requirements including issuance of a finding of suitability to transfer and control of land use consistent with the OU 10-04 ROD	FFA/CO (DOE-ID 1991) CERCLA [42 USC 9620 § 120(h)(3)][d] CERCLA [42 USC 9620 § 120(h)(3)(C)(ii)][e] CERCLA [42 USC 9620 § 120(h)(3)(A)(iii)][f] CERCLA [42 USC 9620 § 120(h)(1)-(3)][g] CERCLA [42 USC 9620 § 120(h)(4)][h] Property relinquishment notification (43 CFR 2372.1)[i] Criteria for Bureau of Land Management (BLM) acceptance of property 43 CFR 2374.2[j] Excess property reporting requirements (41 CFR 101-47.202-1,-2,-7)[k] Property release restrictions (DOE Order 5400.5)
Site: BORAX-09, BORAX II through V. The site consists of the entombed belowground structures remaining from AEF-601. Current occupational scenario risk estimates are greater than 1E-04.					
Current DOE operations	Burial site—no unauthorized intrusion into the entombed structures and buried waste	Radionuclides—exposure to subsurface soil and buried waste	Maintain integrity of containment barrier	1. Visible access restrictions (warning signs) 2. Control of activities (drilling or excavating)	*Federal Facility Agreement and Consent Order* (FFA/CO) (DOE-ID 1991) Worker protection (10 CFR 835) Radiation protection of the public and as low as reasonably achievable principles (DOE Order 5400.5) National Oil and Hazardous Substances Pollution Control Plan (40 CFR Part 300) CERCLA [42 USC 9620 § 120]

Table 34. (continued).

Timeframe	Land Restriction[a]	Exposure Concern	Objective	Controls	Regulatory Basis or Authority
DOE control post operations (i.e., after operations cease and before DOE institutional controls are terminated)	Burial site—no unauthorized intrusion into the entombed structures and buried waste	Radionuclides—exposure to subsurface soil and buried waste	Maintain integrity of containment barrier	1. Visible access restrictions (warning signs) 2. Control of activities (drilling or excavating) 3. Property lease requirements including control of land use consistent with the OU 10-04 ROD	FFA/CO (DOE-ID 1991) CERCLA [42 USC 9620 § 120(h)(5)][c] Hall Amendment of the National Defense Authorization Act (Public Law 103–160)[c] Property release restrictions (DOE Order 5400.5)
Post DOE control	Burial site—no unauthorized intrusion into the entombed structures and buried waste	Radionuclides—exposure to subsurface soil and buried waste	Maintain integrity of containment barrier	Property transfer requirements including issuance of a finding of suitability to transfer and control of land use consistent with the OU 10-04 ROD	FFA/CO (DOE-ID 1991) CERCLA [42 USC 9620 § 120(h)(3)][d] CERCLA [42 USC 9620 § 120(h)(3)(C)(ii)][e] CERCLA [42 USC 9620 § 120(h)(3)(A)(iii)][f] CERCLA [42 USC 9620 § 120(h)(1)-(3)][g] CERCLA [42 USC 9620 § 120(h)(4)][h] Property relinquishment notification (43 CFR 2372.1)[i] Criteria for Bureau of Land Management (BLM) acceptance of property 43 CFR 2374.2[j] Excess property reporting requirements (41 CFR 101-47.202-1,-2,-7)[k] Property release restrictions (DOE Order 5400.5)
Sites: Land Mine Fuze Burn Area (ORD-24), NOAA (ORD-08), and STF-02. Current occupational scenario risk estimates are greater than 1E-04 at both ordnance areas. Lead concentrations at STF-02 greatly exceed the EPA screening level (EPA 1994). Interim controls will be maintained to protect workers until the selected remedies have been implemented.					
Current DOE operations until remedial action is implemented	Industrial	Explosive materials at ORD-24 and ORD-08. Lead contaminated soil at STF-02.	Prevent exposure to contaminated soil, except for approved activities pursuant to the FFA/CO (DOE-ID 1991).	1. Visible access restrictions (warning signs) 2. Control of activities (drilling or excavating)	FFA/CO (DOE-ID 1991) Worker protection (10 CFR 835) National Oil and Hazardous Substances Pollution Control Plan (40 CFR Part 300) CERCLA [42 USC 9620 § 120]

Table 34. (continued).

Timeframe	Land Restriction[a]	Exposure Concern	Objective	Controls	Regulatory Basis or Authority
Sites: Experimental Field Station (ORD-15), Fire Station II Zone and Range Fire Burn Area (ORD-10), Land Mine Fuze Burn Area (ORD-24), NOAA (ORD-08), and NODA (ORD-06). Future residential risk may be greater than 1E-06 after the selected remedies have been implemented because remediation goals are based on the 100-year future residential scenario. Land-use restrictions will be maintained until discontinued based on the results of a 5-year review. Land-use controls will not be required after remediation if contaminant concentrations are below the final remediation goals.					
DOE control post operations (i.e., after operations cease and before DOE institutional controls are terminated)	Industrial	Toxic energetic materials	Control land use as industrial until discontinued based on the results of a 5-year review.	1. Visible access restrictions (warning signs) 2. Control of activities (drilling or excavating) 3. Property lease requirements including control of land use consistent with the OU 10-04 ROD	FFA/CO (DOE-ID 1991) CERCLA [42 USC 9620 § 120(h)(5)][c] Hall Amendment of the National Defense Authorization Act (Public Law 103–160)[c] Property release restrictions (DOE Order 5400.5)
Post DOE control	Industrial	Toxic energetic materials	Control land use as industrial until discontinued based on the results of a 5-year review.	Property transfer requirements including issuance of a finding of suitability to transfer and control of land use consistent with the OU 10-04 ROD	FFA/CO (DOE-ID 1991) CERCLA [42 USC 9620 § 120(h)(3)][d] CERCLA [42 USC 9620 § 120(h)(3)(C)(ii)][e] CERCLA [42 USC 9620 § 120(h)(3)(A)(iii)][f] CERCLA [42 USC 9620 § 120(h)(1)-(3)][g] CERCLA [42 USC 9620 § 120(h)(4)][h] Property relinquishment notification (43 CFR 2372.1)[i] Criterion for BLM acceptance of property (43 CFR 2374.2)[j] Excess property reporting requirements (41 CFR 101-47.202-1,-2,-7)[k] Property release restrictions (DOE Order 5400.5)

Table 34. (continued).

Timeframe	Land Restriction[a]	Exposure Concern	Objective	Controls	Regulatory Basis or Authority
Sites: Naval Proving Ground (including 23 smaller ordnance sites: ORD-03, ORD-04, ORD-05, ORD-06, ORD-07, ORD-08, ORD-10, ORD-11, ORD-12, ORD-13, ORD-14, ORD-15, ORD-16, ORD-17, ORD-18, ORD-19, ORD-20, ORD-22, ORD-24, ORD-25, ORD-26, ORD-27, and ORD-28), Arco High-Altitude Bombing Range (ORD-01), and Twin Buttes Bombing Range (ORD-09). Current occupational scenario risk estimates are presented to human health from unintentional detonation of UXO. Interim controls will be maintained to protect workers until the selected remedies have been implemented. Institutional controls will be maintained until discontinued based on the results of a 5-year review. Land-use controls will not be required after remediation if detection methods allow for a complete removal of UXO from the site.					
Current DOE operations until remedial action is implemented	Industrial	UXO — potential for unintentional detonation	Prevent exposure to potential UXO, except for approved activities pursuant to the FFA/CO (DOE-ID 1991).	1. Visible access restrictions (warning signs) 2. Control of activities (drilling or excavating)	*Federal Facility Agreement and Consent Order* (FFA/CO) (DOE-ID 1991) Worker protection (10 CFR 835) Radiation protection of the public and as low as reasonably achievable principles (DOE Order 5400.5) National Oil and Hazardous Substances Pollution Control Plan (40 CFR Part 300) CERCLA [42 USC 9620 § 120]
DOE control post operations (i.e., after operations cease and before DOE institutional controls are terminated)	Industrial	UXO — potential for unintentional detonation	Control land use as industrial until discontinued based on the results of a 5-year review.	1. Visible access restrictions (warning signs) 2. Control of activities (drilling or excavating) 3. Property lease requirements including control of land use consistent with the OU 10-04 ROD	FFA/CO (DOE-ID 1991) CERCLA [42 USC 9620 § 120(h)(5)][c] Hall Amendment of the National Defense Authorization Act (Public Law 103–160)[c] Property release restrictions (DOE Order 5400.5)

Table 34. (continued).

Timeframe	Land Restriction[a]	Exposure Concern	Objective	Controls	Regulatory Basis or Authority
Post DOE control	Industrial	UXO — potential for unintentional detonation	Control land use as industrial until discontinued based on the results of a 5-year review.	Property transfer requirements including issuance of a finding of suitability to transfer and control of land use consistent with the OU 10-04 ROD	FFA/CO (DOE-ID 1991) CERCLA [42 USC 9620 § 120(h)(3)][d] CERCLA [42 USC 9620 § 120(h)(3)(C)(ii)][e] CERCLA [42 USC 9620 § 120(h)(3)(A)(iii)][f] CERCLA [42 USC 9620 § 120(h)(1)-(3)][g] CERCLA [42 USC 9620 § 120(h)(4)][h] Property relinquishment notification (43 CFR 2372.1)[i] Criterion for BLM acceptance of property (43 CFR 2374.2)[j] Excess property reporting requirements (41 CFR 101-47.202-1,-2,-7)[k] Property release restrictions (DOE Order 5400.5)
Sites: BORAX-01, BORAX-08, OMRE-01. Risk estimates for the current worker scenario are between 1E-06 and 1E-04. Institutional controls will be maintained until discontinued based on the results of a 5-year review.					
Current DOE operations	Industrial	Radionuclides — external radiation	Prevent exposure to contaminated soil, except for approved activities pursuant to the FFA/CO (DOE-ID 1991).	1. Visible access restrictions (warning signs) 2. Control of activities (drilling or excavating)	FFA/CO (DOE-ID 1991) Worker protection (10 CFR 835) National Oil and Hazardous Substances Pollution Control Plan (40 CFR Part 300) CERCLA [42 USC 9620 § 120]
DOE control post operations (i.e., after operations cease and before DOE institutional controls are terminated)	Industrial	Radionuclides— minimal concern	Control land use as industrial until discontinued based on the results of a 5-year review.	Property lease requirements including control of land use consistent with the OU 10-04 ROD	FFA/CO (DOE-ID 1991) CERCLA [42 USC 9620 § 120(h)(5)][c] Hall Amendment of the National Defense Authorization Act (Public Law 103–160)[c] Property release restrictions (DOE Order 5400.5)

Table 34. (continued).

Timeframe	Land Restriction[a]	Exposure Concern	Objective	Controls	Regulatory Basis or Authority
Post DOE control	Industrial	Radionuclides—minimal concern	Control land use as industrial until discontinued based on the results of a 5-year review.	Property transfer requirements including issuance of a finding of suitability to transfer and control of land use consistent with the OU 10-04 ROD	FFA/CO (DOE-ID 1991) CERCLA [42 USC 9620 § 120(h)(3)][d] CERCLA [42 USC 9620 § 120(h) (3)(C)(ii)][e] CERCLA [42 USC 9620 § 120(h)(3)(A)(iii)][f] CERCLA [42 USC 9620 § 120(h)(1)-(3)][g] CERCLA [42 USC 9620 § 120(h)(4)][h] Property relinquishment notification (43 CFR 2372.1)[i] Criterion for BLM acceptance of property (43 CFR 2374.2)[j] Excess property reporting requirements (41 CFR 101-47.202-1,-2,-7)[k] Property release restrictions (DOE Order 5400.5)
Sites: EBR-08 and ORD-21. Buried contaminated media remain at these two sites. At EBR-08, soil contaminated with TPH-diesel is present at a depth of 18 ft below the surface. At ORD-21, an estimated 16,000 pounds of UXO remains buried 135 ft below ground.					
Current DOE operations	Industrial	Various—minimal concern	Prevent exposure to potential UXO or contaminated soil, except for approved activities pursuant to the FFA/CO (DOE-ID 1991).	1. Visible access restrictions (warning signs) 2. Control of activities (drilling or excavating)	FFA/CO (DOE-ID 1991) CERCLA [42 USC 9620 § 120(h)(5)][c] Hall Amendment of the National Defense Authorization Act (Public Law 103–160)[c] Property release restrictions (DOE Order 5400.5)
DOE control post operations (i.e., after operations cease and before DOE institutional controls are terminated)	Industrial	Various—minimal concern	Control land use as industrial until discontinued based on the results of a 5-year review.	1. Visible access restrictions (warning signs) 2. Control of activities (drilling or excavating) 3. Property lease requirements including control of land use consistent with the OU 10-04 ROD	FFA/CO (DOE-ID 1991) CERCLA [42 USC 9620 § 120(h)(5)][c] Hall Amendment of the National Defense Authorization Act (Public Law 103–160)[c] Property release restrictions (DOE Order 5400.5)

Table 34. (continued).

Timeframe	Land Restriction[a]	Exposure Concern	Objective	Controls	Regulatory Basis or Authority
Post DOE control	Industrial	Various—minimal concern	Control land use as industrial until discontinued based on the results of a 5-year review.	Property transfer requirements including issuance of a finding of suitability to transfer and control of land use consistent with the OU 10-04 ROD.	FFA/CO (DOE-ID 1991) CERCLA [42 USC 9620 § 120(h)(3)][d] CERCLA [42 USC 9620 § 120(h)(3)(C)(ii)][e] CERCLA [42 USC 9620 § 120(h) (3)(A)(iii)][f] CERCLA [42 USC 9620 § 120(h)(1)-(3)][g] CERCLA [42 USC 9620 § 120(h)(4)][h] Property relinquishment notification (43 CFR 2372.1)[i] Criterion for BLM acceptance of property (43 CFR 2374.2)[j] Excess property reporting requirements (41 CFR 101-47.202-1,-2,-7)[k] Property release restrictions (DOE Order 5400.5)

a. Institutional controls are applicable only to sites where hazardous substances, pollutants, or contaminants are present that preclude unlimited land use. Surveillance will be conducted every 5 years to ensure that controls are in place.

b. The BORAX-02 site was previously remediated under the WAG 5 ROD for the Stationary Low Power Reactor 1 (SL-1) OU 5-05 and BORAX I Burial Grounds OU 6-01 and ten No Action sites. The selected remedy included, periodic aboveground radiological surveys to assess the effectiveness of the remedial action; periodic inspections and maintenance to ensure cap integrity and surface drainage away from the barriers; access restrictions consisting of fences, posted signs, and permanent markers; restrictions limiting land use to industrial applications for at least 100 years following completion of the cap; and review of the remedy no less often than every five years until determined by the regulatory agencies to be unnecessary.

c. Consult and request concurrence of U.S. Environmental Protection Agency with proposed leases of sites that are on the National Priorities List (54 FR 48184) sites.

d. A statement that remedial action is complete is required in the deed.

e. If response action for which the federal government is responsible is not complete, restrictions, the response guarantee, the schedule for investigation, and completion of all necessary response actions and budget assurances must be included in the deed.

f. A clause allowing the U.S. government access to the property must be included in the deed.

g. A notice of information about hazardous substances present on the property must be included in the deed.

h. Uncontaminated parcels of land must be identified with concurrence of the EPA administrator before termination of operations.

i. A Notice of Intent with contamination information and protection needs is required to relinquish the property to the U.S. Department of Interior.

j. Transfer to the U.S. Department of Interior must indicate continuation of DOE responsibility.

k. Report to the General Services Administration on contamination information and allowable land use for excess real property is required.

Table 35. Cost estimate summary for WAGs 6 and 10 institutional controls.

Planned Activity	Cost (Fiscal Year 2001 dollars)
FFA/CO management and oversight	
WAG 10 management	NA
Remedial design	NA
Remedial action—construction subcontract	NA
Project construction management	NA
CAPITAL COST SUBTOTAL	NA
TOTAL CAPITAL COST IN FISCAL YEAR 2001 DOLLARS	NA
TOTAL CAPITAL COST IN NET PRESENT VALUE	NA
Operations	
Program management	NA
Data collection and management for WAG-wide 5-year reviews (100 years)	557,000
Caretaker/maintenance	3,704,000
Sampling	632,000
Decontamination and dismantlement	NA
Surveillance	NA
OPERATIONS AND MAINTENANCE COST SUBTOTAL	4,893,000
Contingency @ 30%	1,467,900
TOTAL OPERATIONS AND MAINTENANCE COST IN FISCAL YEAR 2001 DOLLARS	6,360,900
TOTAL OPERATIONS AND MAINTENANCE COST IN NET PRESENT VALUE	2,957,500
TOTAL PROJECT COST IN NET PRESENT VALUE	2,957,500

Within 6 months of the signature of this ROD, a status report about monitoring the effectiveness of WAGs 6 and 10 institutional controls will be submitted to the EPA and IDEQ, which will be followed by a Comprehensive INEEL-wide institutional control status report. An updated institutional control monitoring report based on the results of onsite inspections will be submitted to the EPA and IDEQ at least annually thereafter until the first 5-year review. The deadline for the initial and subsequent monitoring reports may be modified, subject to approval by the EPA and IDEQ, to accommodate the submittal of one monitoring report for all operable units and all institutional controls within WAGs 6 and 10, and possibly one or more monitoring reports for all INEEL waste area groups, and thereby allow integration of different decision document signature dates. In addition, after the INEEL comprehensive approach is well established and its effectiveness has been demonstrated, the frequency of future monitoring reports may be modified, subject to approval by the EPA and IDEQ. At a minimum, the institutional controls monitoring report will contain the following components:

- A description of the means employed to meet institutional control requirements
- A description of the means employed to meet waste site-specific objectives, including the results of visual field inspections of all areas subject to waste site-specific restrictions

- An evaluation of the effectiveness of the approach at meeting all WAG-wide institutional control requirements and waste site-specific objectives

- A description of any deficiencies of the approach and the efforts or measures that have been or will be taken to correct problems.

The DOE will notify the EPA and IDEQ immediately upon the discovery of any activity that is inconsistent with institutional control objectives or of any change in the land use or land-use designation of a site addressed in the WAGs 6 and 10 list of areas or locations covered by institutional controls. The DOE will work together with the EPA and IDEQ to determine a plan of action to rectify the situation, except when DOE believes that an activity creates an emergency situation. The DOE can respond to the emergency immediately upon notification to the EPA and IDEQ and need not wait for the EPA or IDEQ input to determine a plan of action. The DOE will identify the problems with the institutional control process, determine the changes necessary to correct the process to avoid future problems, and implement these changes after consulting with the EPA and IDEQ.

The DOE will identify a point of contact for implementing, maintaining, and monitoring institutional controls.

The DOE will notify EPA and IDEQ at least 6 months before the transfer, sale, or lease of any property subject to institutional controls required by a decision document. Such notification will allow the involvement of the EPA and IDEQ in discussions to ensure that appropriate provisions are included in the conveyance documents to maintain effective institutional controls. If it is not possible for DOE to notify the EPA and IDEQ at least 6 months before the transfer, sale, or lease of any property subject to institutional controls, then DOE will notify the EPA and IDEQ as soon as DOE learns of the possible transfer.

The DOE will not delete or terminate any institutional control unless the EPA and IDEQ have concurred in the deletion or termination.

Operable unit-specific institutional controls will be transitioning to site-wide institutional controls. A comprehensive site-wide institutional control approach will be developed as part of the OU 10-04 O&M plan.

11.2.1 INEEL-Wide Ecological Monitoring

No action with long-term ecological monitoring will be implemented under this ROD because of concerns at the INEEL to sustain a healthy environment and the many uncertainties that resulted from the comprehensive INEEL-Wide ERA. Concern about the impact of the INEEL's activities on the environment has been reflected in long-term monitoring, research, and analysis of the environment during the 50 years that the INEEL has been in operation. The OU 10-04 comprehensive investigation included a comprehensive analysis of ecological risk information available from the 10 WAGs encompassed by the INEEL environmental restoration mission. The purpose of the INEEL-wide ecological risk assessment (ERA) was to compile the information from all previous investigations of risk to ecological receptors at each WAG into a depiction of the effects of contamination on the environment of the INEEL as a whole.

An ecological risk assessment usually requires consideration of many more factors than does a human health risk assessment. For example, more than 200 species of plants and animals can be found on the INEEL, either part or all of the year. These species interact in numerous and complex ways, such as predation, plant eating, and scavenging, which must be taken into account. As well, the ecological risk assessment must take into account wide variations in ranges including migration patterns, and must also

account for the tendency for many contaminants to accumulate as they move up the food chain. Finally, since many plant and animal species on the INEEL have not been extensively studied in terms of their habitat requirements, life cycle, or tolerance to the range of contaminants released, the ERA is subject to a number of areas of uncertainty. These uncertainties were identified by the Agencies in 1997 through 1999 as part of the INEEL-wide ERA planning process. Uncertainty issues relevant to the INEEL-wide ERA are presented in Section 17 and Appendix F of the OU 10-04 Comprehensive RI/FS (DOE-ID 2001).

The OU 10-04 INEEL-wide ERA used a multiple line of evidence approach to support the risk conclusions. This approach included assessments of ecologically sensitive areas, ecological sampling on site, breeding bird survey, long-term vegetation transect, radiological biota studies, air dispersion modeling, biological surveys for sensitive species and/or habitat, spatial distribution of contamination, and WAG ERA summaries. The spatial analysis concluded that less than 20 percent of the habitats present on the INEEL are lost to facility activities and that there is minimal risk to the INEEL's diverse plant and animal communities. However, based on the multiple uncertainties and assumptions in the assessment it was determined that ecological monitoring would be critical to ensure protection of this important ecosystem.

Long-term ecological monitoring at the INEEL will include the following activities:

- Activities will be planned to develop a comprehensive surveillance and monitoring plan that supports eliminating the uncertainty in the Site-wide ERA, allows coordination with on-going air, soils, surface water, groundwater and vadose zone surveillance and monitoring efforts, allows coordination with other agency activities (such as sagegrouse studies) and addresses stakeholder concerns.

- A schedule for site walk-downs and visual inspections in the WAG site areas will be developed to ensure that assumptions in the risk assessment are still applicable.

- Yearly sampling and analysis of site-specific flora and fauna for ecological contamination based on location or area-specific field sampling plans (approximately 10% of these samples will be taken from off-Site locations for background comparison and to monitor off-Site migration of contamination by ecological receptors).

- Contaminated media such as sample residue, sampling equipment, and personnel protective equipment generated as a result of these activities will be appropriately characterized, assessed, and dispositioned in accordance with regulatory requirements.

- An annual status report will be provided to the agencies. These annual reports will support the 5-year review.

- Selected research studies will be performed to support the development and understanding of long-term trends in the INEEL's ecology (such as measuring effects to INEEL populations or individual species).

12. ADDITIONAL COMPONENTS OF THE SELECTED REMEDY FOR OPERABLE UNITS 6-05 AND 10-04

In addition to the remediation that will be applied to specific sites, several activities will be implemented within WAGs 6 and 10 to complete the selected remedy. These activities, including disposition of stored and investigation-derived waste and groundwater monitoring, are discussed below.

12.1 Disposition of Stored Waste and Investigation and Remediation-Derived Waste

Contaminated media such as soil, debris, liquids, sample residue, sampling equipment, and personal protective equipment, not identified by the INEEL FFA/CO or in this comprehensive investigation, may be generated as a result of RD/RA activities at OU 10-04 sites. Procedures to address the remediation-derived waste will be documented in the remedial action work plan. In addition, waste that has been generated as a result of previous sampling activities at WAG 6 or 10 sites will be appropriately characterized, assessed, and dispositioned in accordance with regulatory requirements to achieve remediation goals consistent with remedies selected for the sites in this ROD.

12.2 Groundwater Monitoring

The risk estimates for groundwater for the WAG 6 and 10 sites of concern are presented in the OU 10-04 Comprehensive RI/FS (DOE-ID 2001). For the TNT/RDX sites, the risk from groundwater use exceeded 1E-04 at the NODA site (1E-02) and the hazard indices were greater than 1.0 at 3 ordnance areas: NODA, NOAA, and Land Mine Fuze Burn Area (hazard indices were 100, 6, and 8 respectively) (DOE/ID 2001). These risk estimates were based on results from the GWSCREEN fate and transport model and not on actual well samples. The primary contaminants of concern contributing risk through the groundwater pathway include RDX and TNT.

Results of the GWSCREEN modeling are conservative in that the source of contamination is assumed to be evenly distributed across the top of the site, which increases the mass of contamination considered. Infiltration is assumed to occur through all contaminated areas, and all contamination is assumed to contribute to groundwater contamination (for further information on the GWSCREEN model see Appendix D of the OU 10-04 RI/FS [DOE-ID 2001]). In addition, the human health risk assessment assumes a future resident lives at the site adjacent to a groundwater well and is constantly exposed to the modeled exposure point concentrations. The peak exposure times for TNT and RDX occur after the 100-year period of institutional control, thus coinciding with the future residential risk scenario. Risk from ingestion of groundwater was calculated using the maximum contaminant concentrations generated from modeling. The risks to human health from groundwater ingestion at the Land Mine Fuze Area, NOAA, and NODA are discussed in Sections 9.3.3.1, 9.4.3.1, and 9.5.3.1 respectively.

The selected remedy for the TNT/RDX sites (Removal, Treatment of TNT/RDX Fragments, Disposal of Soil, and Institutional Controls), discussed in Section 9.9, will reduce the risk through the groundwater pathway. Based on the nature of the contamination it was not anticipated that these contaminants had migrated to the groundwater and subsequently INEEL and USGS wells have not yet been sampled for secondary explosive compounds or degradation products (nitroaromatic and nitramine compounds). Groundwater sampling for nitroaromatics and nitramines will be conducted at groundwater wells downgradient of the TNT/RDX sites. The monitoring wells and specific analytes will be specified in the OU 10-04 scope of work, which will be submitted to the agencies within 21 days after this ROD is signed. Monitoring from the indicator wells will continue if nitroaromatic or nitramine compounds are detected in any groundwater sample, at least until the first periodic remedy review or statutory 5-year

review to verify the assumption that nitroaromatic or nitramine contamination has not reached the aquifer. Groundwater remediation will be considered if contaminant concentration levels in ground water exceed the EPA drinking water advisory levels at 1E-04 cancer risk for nitroaromatics and nitramines (EPA 2002a), which are as follows:

- TNT 100 ug/L
- RDX 30 ug/L
- 2,4-DNT 5 ug/L
- 2,6-DNT 5 ug/L

If sampling results indicate groundwater contamination is at or above any of these concentrations, an assessment will be performed to determine the extent of contamination and the associated risk. If the risk is determined to be unacceptable, remedial alternatives will be developed and evaluated; a preferred remedy will be selected, and this ROD will be amended to implement the preferred remedial action.

If monitoring is required, a determination will be made during a remedy or statutory 5-year review to continue or discontinue monitoring for nitroaromatics and nitramines. Costs for monitoring the full suite of groundwater analytes are included in the estimate for 5 years of groundwater monitoring provided in Table 36. Any groundwater monitoring required for OU 10-04 will be conducted under OU 10-08 (DOE/ID 2002).

Table 36. Estimated costs for groundwater monitoring at WAGs 6 and 10.

Operations	Planned Activity	Cost (Fiscal Year 2001 dollars)
	Field sampling plan	14,000
	Annual sampling for 5 years	387,000
	5-Year reviews	278,000
OPERATIONS AND MAINTENANCE COST SUBTOTAL		679,000
	Contingency @ 30%	204,000
TOTAL OPERATIONS AND MAINTENANCE COST IN FISCAL YEAR 2001 DOLLARS		883,000
TOTAL OPERATIONS AND MAINTENANCE COST IN NET PRESENT VALUE		550,000
TOTAL PROJECT COST IN NET PRESENT VALUE		550,000

Risk estimates for the groundwater at the STF-02 Gun Range were not calculated. Lead concentrations potentially attributable to INEEL operations at STF-02 that have been detected in groundwater monitoring wells at STF fall below the EPA action level and Idaho groundwater quality standard for lead of 15 µg/L (EPA 1996 and IDAPA 58.01.11.200). This site will be remediated because the surface soil lead concentrations at this site significantly exceed the EPA screening level of 400 mg/kg (EPA 1994). The selected remedy for the STF Gun Range will address potential contamination of groundwater from lead.

13. DOCUMENTATION OF SIGNIFICANT CHANGES

Several issues relative to the components of the selected remedy for WAGs 6 and 10 were either not presented in the OU 10-04 Proposed Plan (DOE-ID 2002) or were modified after the Proposed Plan was published. These differences from the Proposed Plan are discussed below.

13.1 Modification to Alternatives for the STF Gun Range

The proposed plan describes the STF-02 Gun Range as being within the boundary of the Naval Gun Range Ordnance Area and states that the remedy selected for UXO will also apply at this site. This is inaccurate; although the STF-02 Gun Range is near the southeast edge of the Naval Gun Range, it is not in the direction of fire, hence the presence of UXO is unlikely. Additionally, heavy equipment was previously used at the site to construct the berms at the Gun Range. Therefore, a survey for UXO is not required for implementation of the selected remedy.

The Proposed Plan identified the railroad ties as being a nonhazardous waste, which is incorrect. The railroad ties contain many bullet fragments and are considered RCRA hazardous for lead. The railroad ties will be treated by encapsulation to meet RCRA disposal criteria for hazardous debris and disposed in an approved RCRA hazardous waste landfill.

13.2 Cost Estimate Revisions for the Ordnance Areas and TNT/RDX Contaminated Sites

During development of this ROD, it was determined that deed restriction reviews during the 100-year period of institutional control at the INEEL for the Ordnance Areas and the TNT/RDX sites were not required. Therefore, the cost element for deed restriction reviews was deleted from the cost estimates presented in this ROD for all alternatives for the Ordnance Areas and the TNT/RDX sites with the exception of the no action alternative, which did not include a cost element for deed restriction reviews. This reduced the cost estimates by approximately $450,000, which is the cost for the deed restriction reviews with 30% contingency.

14. REFERENCES

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